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REVIEW ARTICLES

- (1) "The Present Position of Phenothiazine as an Anthelmintic".
- (2) "Trichomoniasis—A Review of Recent Literature".

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DISEASES CAUSED BY BACTERIA AND FUNGI

LAING, J. A., & DOWNE, C. H. (1946.) Bovine infertility associated with staphylococcal infection.—*Vet. Rec.* 58. 224-225. 2444

Most of a herd of 41 cows calved in the autumn, 1943, and following this there were a large number of returns to service at three or six weeks, with a purulent vaginal discharge. This continued in most of the animals until the following April, when only four were pregnant. Two bulls were used over the whole period, and in both cases semen was found to be normal and microbe-free. Heifer fertility on the farm was normally good throughout, confirming that the disease was not venereally spread.

Trichomonas was not revealed by examination of the discharges and there were no positive blood agglutination reactions to this organism in the proportion of the herd tested. Three cows which had aborted at five months were brucella-negative by blood test. Vaginal swabs revealed streptococci, haemolytic *Bact. coli*, and mixed staphylococci in large numbers from most animals. Swabs exposed on the endometrium (by the use of a tubular sheath) were sterile or else gave staphylococci on culture.

Treatment consisted of intra-uterine irrigations with 1 : 1,000 acriflavine and the administration of staphylococcal toxoid, which provoked a good antitoxin response. The discharges appeared to cease following irrigation, although they had previously resisted Lugol's iodine, and fully half the herd held to the first service given soon after. Staphylococci were found finally, in small numbers, in only two of the representative group swabbed. These two cows were pregnant.

The authors do not claim to have demonstrated that the staphylococci were responsible for the disease condition.—F. L. M. DAWSON.

VAN DEN BERG, W. (1946.) Vergelijkend onderzoek tusschen streptococcen en corynebacteriën uit den uier de scheede van het rund in verband met de wijze van infectie. [A comparison of streptococci and corynebacteria isolated from

the bovine udder and vagina and their method of infection.]—*Tijdschr. Diergeneesk.* 71. 71-81. 2445

The author suggests that streptococci and corynebacteria are phases of the same organism. He also suggests that the vagina is the source from which the udder becomes infected in mastitis and that the transference of organisms from the vagina to the udder occurs *via* the blood stream. [The evidence in support of these suggestions is scanty and unconvincing].—G. HUEHNS.

HUTCHINSON, I. R. (1946.) Pathogenicity of group C (Lancefield) haemolytic streptococcus.—*Brit. med. J.* Oct. 19th. 575-576. 2446

The source of 105 strains of Lancefield Group C haemolytic streptococci is described and their pathogenic significance discussed. While a number of strains found in routine swabbings were saprophytes only, others were associated with infections of the throat, of the soft tissues, or of the puerperal uterus. Although most of these infections were mild, severe ones do occur. One strain had given rise even to a septicaemia.

—A. MAYR-HARTING.

WILSON, A. T. (1945.) Loss of group carbohydrate during mouse passages of a Group A hemolytic streptococcus.—*J. exp. Med.* 81. 593-596. 2447

A haemolytic streptococcus, Group A, Type 27, which had low mouse virulence was dried and kept for a long time frozen. When the dried material was put through a series of mouse passages it increased markedly in virulence and at the same time was found to have lost completely its Group-specific carbohydrate, without having acquired that of a different Group. It was still Type 27 by serological and mouse protection tests. When another series of mouse passages from the frozen and dried strain was started, an increase in virulence was again obtained, but on this occasion the phenomenon of loss of the Group specific carbohydrate did not occur.

—A. MAYR-HARTING.

HERMANSSON, K. A. (1945.) Ett fall av tuberkulös infektion i funiculus umbilicalis hos större kalv. **[TB. of the umbilicus in a calf.]**—*Skand. VetTidskr.* 35. 609–613. [Abst. from English summary.] 2448

H. describes, with illustrations, a case of congenital TB. in the umbilical cord of a three-month-old calf, calcified tuberculous lesions being present in the portal lymph nodes. There were miliary tubercles in the skin of the umbilicus and tuberculous lesions in the umbilical vein.

The dam had TB. of the uterus and tubercle bacilli were present in the vaginal exudate. H. considers that the umbilical cord was infected by this exudate during parturition.

REYES, H. A. (1946.) **Tuberculosis bovina. [Bovine TB.]**—*Rev. Med. vet. Bogotá.* 15. 20–34. 2449

R. gives a lengthy discussion on the mammalian and avian tubercle bacilli from the bacteriological and immunological aspects and reviews methods of diagnosis and the eradication of bovine TB. with particular reference to the methods of eradication used in the U.S.A. No new knowledge is presented.—I. W. JENNINGS.

LINDAU, A. (1944.) **Bovine tuberculosis in man, with special reference to Scandinavian experiences. Baeteriological points of view and determination of the type of infecting bacilli.**—*Acta path. microbiol. scand.* Suppl. No. 54. 693–706. [In English. Abst. from author's summary.] 2450

A survey of the frequency of bovine type TB. in man in different countries is given, with especial reference to Scandinavian investigations. In districts with widespread TB. in cattle, bovine infection in man plays an important role in all forms of the disease. Of non-selected material sent in 1936–39 for routine diagnosis to the Bacteriological Institute at Lund, 8.9% was infected with bovine type bacilli.

In order to acquire information about the frequency of bovine pulmonary TB. in Skåne, 5,327 specimens of sputum, stomach washing and pleural exudate were examined by g. pig tests and cultivation on Loewenstein's medium and an additional 1,178 specimens were cultured on Loewenstein's medium. 2,811 specimens had human type bacilli and 79 bovine type; 3,615 were negative. The frequency of bovine type pulmonary TB. in Skåne accordingly amounts to about 2.73%, but this figure is undoubtedly too low as only 5% of the specimens were from children. Further, some strains must have been lost by omitting g. pig inoculation in part of the material.

The spread of bovine infection can be :—(a)

from cattle to man, through drinking infected milk or, in adult country people, through inhalation, (b) from man to man, e.g., secondary cases in the same family, or (c) from man to cattle, cowmen and proprietors with bovine phthisis infecting a herd previously free from TB.

PROKŮPEK, K. (1946.) Hodnocení deviací komplementu při tuberkulóse skotu a koz. **[The value of the complement fixation test in TB. of cattle and goats.]**—*Čas. československ. Vet.* 1. 449–454. 2451

In order to compare the results of c.-f. tests with the results of intradermal tuberculin tests P. examined 1,949 blood sera from cattle and 494 from goats. 540 c.-f. tests were carried out with blood sera from reacting cattle (340 tests with active and 200 tests with inactivated sera). The results were as follows :—of 340 samples of active blood serum, 54.41% reacted positively and 41.8% negatively. Of 200 samples of inactivated blood serum, 51.50% were positive and 45.17% negative. Of 32 active blood sera from reacting goats 93.8% reacted positively and 3.1% negatively. Of six samples of inactivated blood serum 66.6% were positive and 33.3% negative to the c.-f. test.

No relation has been found between the age of reacting cattle and goats and the results of the c.-f. test. In non-reacting animals the results of c.-f. tests agreed with those of tuberculin tests in 85.69% of the cattle and 89.69% of the goats. In reacting cattle it was confirmed by P.M. examination in 83.33%. P. considers the c.-f. test to be valuable in the detection of TB. in cattle.—E. PŘIBYL.

*VACCARO, H. V., & PAREDES, L. (1945.) Pasaje transplacentario del bacilo de Koch, estudio experimental. **[Transplacental tuberculous infection.]**—*Ap. respir. Tuberc., Chile.* 10. 11. [Abst. in *Amer. Rev. Tuberc.* 52. No. 5. pp. 111–112 of absts., copied *verbatim*. Signed: H. BEHM.] 2452

The transmission of tuberculosis from the mother to the fetus was studied experimentally. Twelve rabbits were subcutaneously inoculated with avian tubercle bacilli. Blood cultures were made during pregnancy and in the litter, after delivery. The avian tubercle bacilli produce a chronic type of tuberculosis, which permits the rabbit to live up to twelve months, and in this way several successive gravidities could be observed. It has thus been possible to study the transmission of the bacilli during various different stages of the disease in the mother.

Positive transplacental transmissions of avian bacilli to the fetus were shown in 36.66 per cent, most of which took place between the third and sixth month of the disease, in other words, when

it was at its apex. In 60 per cent of the positive cases, bacillæmia in the mother was also recorded, whereas they were not found in any of the negative cases. According to these findings, the placenta is apparently subject to periodic discharges of tubercle bacilli, which, when repeated with intensity, makes the placenta permeable to the bacilli. The passing through of the bacilli preferably takes place during the second half of pregnancy, when the histological layers of the placenta become thinner, and the enzymatic capacity of the cells decrease. On the other hand, it may be deduced, from the study of the tuberculous rabbits which were pregnant several times, that pregnancy does not seem to aggravate pulmonary tuberculosis in the mother. Attention is also called to the small proportion (3.63 per cent) of abortions and premature deliveries in this experimental study.

In a second series of studies, 26 guinea pigs were inoculated intracardially with avian bacilli, and were killed shortly thereafter. In these cases acute tuberculosis was obtained. There were 53.85 per cent. of transplacental transmissions, and tubercle bacilli were found in the fetal organs and in the amniotic fluid as early as thirty to sixty minutes after inoculation. The fact that, in spite of the existence of tuberculosis of the placenta in 100 per cent of the cases, only half of the fetuses were found to be infected shows that this has not been a mere mechanical outflow of the bacilli through the placenta. On the other hand, according to findings of other observers, a great majority of the transplacental transmissions of germs take place in the presence of a normal placenta. Transmission is therefore due to the virulence itself of the microbe. It is noted that tuberculous microscopic lesions were not found in any of the fetuses which were positive in the bacteriological investigation. This discrepancy is probably due to the low ability to react of the fetal organs, when confronted with the tubercle bacilli.

*BLANCH, P. C., BLANCH, H. C., & LIEUTIER, H. (1945.) Posición de la vacuna B.C.G. en la profilaxis de la tuberculosis. [BCG and the prophylaxis of TB.]-*Rev. Tuberc., Uruguay*. 13. 1. [Part of abst. in *Amer. Rev. Tuberc.* 55. No. 3. p. 63 of absts., copied *verbatim*.] 2453

This is the report of the Uruguayan Commission for the study of BCG vaccination in the prevention of tuberculosis, given to the Pan American Tuberculosis Congress in Havana, January, 1945. Only some of the conclusions of this paper, which reviews the work done in Uruguay in this field since 1930, can be given. The oral vaccination of the new-born has been more and more abandoned in favor of the sub-

cutaneous, the intracutaneous and the multipuncture (Rosenthal's) methods. The authors who have vaccinated over 103,000 babies do not share in an exaggerated enthusiasm for BCG vaccination. The mortality from tuberculosis amongst the vaccinated and nonvaccinated was almost the same: 7 per cent of the vaccinated and 5.2 per cent of the nonvaccinated died of tuberculosis. The authors do not believe that there is any specific immunity conveyed by the application of BCG, especially if it is not repeated. Of the 103,208 babies, 68,005 babies received BCG orally; 15,302, subcutaneously; 1,372, intracutaneously; 18,359, by the multiple puncture method; 8,000 babies are vaccinated every year which represents 20 per cent of all new-born. It was found that the intracutaneous vaccination results in early, intense and prolonged allergy. The protection obtained by BCG is most obvious where the baby continues to live in infected surroundings and is exposed to massive contact with tubercle bacilli. But, in spite of the improvement in the administration of BCG and in spite of the resulting allergy, BCG has not been able to check tuberculous infection and evolution. Despite some favorable results, the vaccinated baby should not be allowed to live in an infected medium. In fact, no baby should be vaccinated if separation from his contacts cannot be obtained. Very important is a close follow-up with control of the development of the allergy. Revaccination should be done as soon as allergy fades. BCG administered parenterally can increase or even start defenses against superinfection but this protection is subordinated to a great many factors. The authors believe that the intra-cutaneous and Rosenthal's method should be used on every baby coming from tuberculous or suspicious contacts. Periodic tuberculin tests should be made and revaccination be done as long as anergy persists. The protection so obtained is only relative. It is of value against discreet infections and occasional slight exposure, whereas no protection is obtained against exposure to massive, early and repeated infections.

HILLEBOE, H. E. (1947.) BCG vaccination. Plans of the United States Public Health Service.—*Amer. Rev. Tuberc.* 55. 294-296. [Author's conclusions copied *verbatim*.] 2454

BCG vaccine should not be made commercially available at present.

From studies presented at the conference, [Tuberculosis Control Division of the U.S. Public Health Service in Washington, D.C.] it appears that BCG vaccination confers increased resistance to tuberculosis for the limited period of time covered in these studies. Medical literature fails to reveal any proved cases of progressive

disease as a result of BCG vaccination. BCG vaccination can be done without causing severe local reactions. The intracutaneous method of vaccination is recommended for use at present.

In the studies presented, BCG vaccination converted a large percentage of nonreactors (to the tuberculin test) into reactors. Need for revaccination and time interval between vaccination require further study.

It was recommended that a single laboratory be established by the Tuberculosis Control Division [U.S. Public Health Service] to produce BCG vaccine for the whole country for use in research programs proposed at this conference. Extensive investigations should be carried on coöperatively with recognized research groups throughout the country during the coming years, especially in population groups highly exposed to tuberculous infection. It was recommended that the Tuberculosis Control Division set up a controlled study in a community containing 100,000 or more people, to determine immediate and long-range results.

Further research is strongly recommended to determine the efficiency of the vaccination and also to attempt to develop a vaccine composed of dead bacilli. It was recommended that methods be developed to standardize techniques of preparation of a potent and stable vaccine for use in the United States and if possible throughout the world.

*SMITH, C. R., URABEC, J. H., & MASON, J. L. (1946.) **Air borne infection in tuberculosis.**—*Calif. West. Med., Tuberc. Suppl.* 65. August. 10. [Abst. in *Amer. Rev. Tuberc.* 55. No. 3. p. 61 of absts., copied *verbatim*.] 2455

Whether tubercle bacilli are transmitted in actual droplets, droplet nuclei or dried dust particles is still a debatable question. In attempting to recover bacilli from the air in tuberculous milieux, three series of tests were run at Barlow Sanatorium: (1) Dishes were set out on the floor of rooms for seven days; the collected dust was processed for smear, culture and animal inoculation; a total of 26 tests were run, using 97 dishes: 7 tests in the laboratory and animal house, 19 in hospital rooms. No living tubercle bacilli were recovered. (2) An electric pump device was used to suck air through 2 cotton filters; 7 tests in 7 hospital rooms housing 10 patients, most of them were strongly positive, open cases, were made; no bacilli were found in the filters. (3) A device for running air through a nebulized spray of sterile water was next used for an average of six hours in each of 5 rooms housing 6 patients. Again, no bacilli were found by culture and animal inoculation. These results inevitably raise many questions concerning air-borne transmission of tuber-

culosis. Hygienic measures employed in the Sanatorium may account in part for these negative results; inadequate facilities for obtaining live bacilli from the air, as well as technical difficulties in demonstrating the bacilli are also responsible. Because of continued infection of student nurses in spite of presumably good hygienic technique, some major means of transmission of the disease must obtain which is not controlled by our present measures.

BIRKHAUG, K. (1947.) **BCG vaccination in Scandinavia. Twenty years of uninterrupted vaccination against tuberculosis.**—*Amer. Rev. Tuberc.* 55. 234–249. [Spanish summary. English summary copied *verbatim*.] 2456

BCG vaccination is to-day generally accepted by the medical profession and laymen in Scandinavia as an important adjuvant to established anti-tuberculosis measures because the vaccine is absolutely harmless and produces a relatively high degree of protection against an exogenous tuberculous infection.

Intracutaneous or transcutaneous BCG vaccination renders non-tuberculin reactors tuberculin-positive in more than 90 per cent within two months after vaccination. In the absence of known tuberculous infection, the duration of allergy following BCG vaccination lasts more than five years, although in some instances it may terminate after one year.

During the period of BCG vaccination allergy and exposure to known tuberculous infection, BCG affords an almost complete protection against the morbid postprimary tuberculous lesions and a relatively high protection against secondary tuberculosis including clinical pulmonary disease.

The basis for the concerted Scandinavian mass BCG vaccination is the importance tuberculosis plays even to-day as an endemic disease—the commonest chronic disease in people between 15 and 30 years. Approximately 50 per cent of this age group do not react to tuberculin. These non-reactors have proved more susceptible to progressive tuberculous disease when infected than those in whom a positive tuberculin reaction indicates a previous infection.

BCG vaccination has in recent years been extended from persons intimately exposed to tuberculous infection, such as nurses, medical students, hospital personnel and children born of tuberculous parents, to army conscripts, students between 14 and 30 years and tuberculin-negative reactors in crowded industries and institutions.

Since 1940, more than 100,000 persons have been vaccinated with BCG in Norway, 58,000 army conscripts, and 250,000 civilians in Sweden and 150,000 persons in Denmark.

CORPER, H. J., & CLARK, C. (1946.) Autolytic tuberculin. Its properties and the significance of its mode of formation.—*Amer. Rev. Tuberc.* 54. 401–412. [Spanish summary.] 2457

The mode of formation and the properties of autolytic tuberculin [see CORPER & COHN—*V.B.* 14. 195 & 15. 13] were subjected to investigation. It was found that autolytic tuberculin production reached a maximum after four months' incubation, that 50% of the wet bacterial mass of a month-old culture was transformed into autolytic soluble products, that the use of vacuum-dried bacteria resulted in a more restricted liberation of autolytic material, that trichloroacetic acid did not precipitate all biologically active substances from bacteria-free filtrates (a tungstic acid precipitate of the filtrate recovered after the use of trichloroacetic acid was biologically active), that trichloroacetic acid precipitation of both heated and unheated filtrates resulted in a slight loss of active material and that pure autolytic dried tuberculin was much more hygroscopic than was P.P.D.

—J. LOCHIEL MCGIRR.

*GUIOT, G., & GHALI, J. D. (1941.) Influence des infiltrations du sympathique sur les intradermo réaction a la tuberculine. [*Sympathetic nerves and tuberculin reaction.*]—*Rev. Tuberc., Paris.* 6. No. 5/6. 521. [Abst. in *Amer. Rev. Tuberc.* 54. No. 1. pp. 20 of absts., copied *verbatim*. Signed: G. SIMMONS.] 2458

Preliminary experimental data favor the conception that tuberculin skin reactions are secondary to an altered sensitivity of the neurovegetative system. Novocain infiltration of the cervico-thoracic sympathetic system decreases the tuberculin response in the homolateral arm both as to size and redness of the reaction. Subsequent injections of novocaine prolong and reinforce this decrease of the tuberculin response; never, however, does the tuberculin test turn entirely negative. Injection of a stellate ganglion only is without effect, probably because not all the sympathetic nerve fibres of the upper extremity pass through it. Some may reach the first thoracic ganglion directly.

PROKŮPEK, K. (1946.) Deviace komplementu při tuberkulóze. [*The complement fixation test in TB.*]—*Čas. československ. Vet.* 1. 340–343. 2459

P. describes the complement fixation test in TB. in cattle and goats and recommends it for use in practice. The test is simple and can be used in large-scale work.—E. PŘIBYL.

SANDSTEDT, H., & LEHNERT, EDV. (1944.) Erfarenheter av under 1943 utförda ympningar mot rödsjuka hos svin. [*Immunization against swine erysipelas in 1943.*]—*Skand VetTidskr.*

34. 130–136. [Abst from English summary.] 2460

The virulence of a culture of *Erysipelothrix rhusiopathiae* was lowered by cultivation on tryptamine agar so that the simultaneous use of serum was unnecessary. At least 15,000 swine were vaccinated and reports received of the results in 8,000 of them.

In 12 cases disturbances of the circulation followed the vaccination. Twenty-one animals contracted swine erysipelas within 2–14 days and two of them died, but some were infected at the time of vaccination, which was carried out at a time when danger of infection was great. No case of swine erysipelas occurred in vaccinated animals for the three months after the 14th day, but cases occurred within this period in non-vaccinated animals.

The authors recommend the use of avirulent vaccine during spring or early summer before cases have become general; after that time they prefer vaccination with virulent culture and serum. They consider that nutritional deficiencies, especially of mineral salts, predispose to infection.

POKORNY, V. (1946.) Pokusné očkování vepřů proti července vakcinou. [*Experimental inoculation of pigs against erysipelas with vaccine (living culture without serum).*]—*Čas. československ. Vet.* 1. 14. 2461

In one group, 21 pigs were inoculated subcutaneously with 5 ml. of living culture of *Erysipelothrix rhusiopathiae*; three pigs served as controls. The pigs were poorly nourished and had clinical signs of infectious bronchopneumonia. 25–35 days after vaccination five inoculated pigs became sick with erysipelas. They were treated with massive doses of serum but had to be killed. Two of the control animals had symptoms of erysipelas and recovered after inoculation with serum. From another group of 18 pigs inoculated with living culture without serum, two had symptoms of erysipelas on the third and 42nd day after vaccination respectively. P. concludes that the inoculation of pigs with living culture without serum does not induce satisfactory immunity against erysipelas.—E. PŘIBYL.

JIRINA, K. (1946.) K aktivní imunizaci selat proti července. [*Active immunization of piglets against swine erysipelas.*]—*Čas. československ. Vet.* 1. 266. 2462

Swine erysipelas is not uncommon in piglets. During 1945, J. found the infection in 52 piglets 2–12 weeks old. He therefore inoculates even small piglets. Sows can be inoculated against the disease in all stages of pregnancy, even a few hours before farrowing, without any harmful effect.

—E. PŘIBYL.

DE MENDONÇA MACHADO, A. (1945.) Infecção espontânea de columbídeos pelo "*B. rhusiopathiae suis*". [An outbreak of *Erysipelothrix rhusiopathiae* infection in pigeons.]—*Repos. Lab. Pat. vet., Lisboa*. 6. 63-66. [English, French and German summaries.] 2463

The carcass of a dove, from a dove-cote in which several birds had died in an epidemic, was submitted for examination. The heart had petechiae and there was haemorrhagic inflammation of the liver and an enlarged spleen. Cultures from the organs yielded *E. rhusiopathiae*. Birds inoculated with antiserum were resistant to such culture but it was fatal to unprotected birds and rats. This is stated to be the first case recorded in Portugal of *E. rhusiopathiae* infection in birds.

—R. MACGREGOR.

LEBEDEV, N. A. (1937.) Patologo-anatomicheskie izmeneniya pri gemorragicheskoi septitseмии telyat. [Pathological and histological changes in haemorrhagic septicaemia of calves.]—*Trud. vsezoyuz. eksp. Inst. Vet.* 14. 144-150. [French summary.] 2464

In 30 calves examined P.M., *Past. vituliseptica*, was found to be the causal organism although *Corynebact. pyogenes* and staphylococci were also present in some cases. The infection was of the following types:—(a) acute, occurring in the first few days after birth and usually terminating in death, and (b) subacute, tending to become (c) chronic. In the last two types localization of lesions was in the lungs, the pleura and at times in the joints.

Pathologically the acute cases had all the changes of septicaemia and pneumonia. In the subacute type there were enlargement (3-4 times) of the bronchial lymph nodes, infection of the umbilicus and inflammation in the joints, with fibrinous exudate, and in chronic cases there were pleural and pulmonary adhesions, varying stages of lobar pneumonia and macroscopical enlargement of the umbilicus. The subacute cases could survive 2-6 weeks and in some cases become chronic cases lasting as long as four months. During that period the calves act as carriers. L. suspects that in all three types infection was *via* the umbilicus.

Symptoms included a rise of temperature (very marked in the acute cases) and painful dry cough, which was more marked on movement; chronic cases were undersized and unthrifty, and although not very ill, had pulmonary lesions.

—OLGA UVAROV.

KARLSSON, K.-F. (1945.) Pseudotuberkulosis hos hönsfaglar. [Pseudotuberculosis in gallinae birds.]—*Skand. VetTidskr.* 35. 673-687. [Abst. from English summary.] 2465

K. deals with 80 cases of *Past. pseudotuberculosis* infection investigated bacteriologically in Sweden. Thirteen of the cases were birds, mostly young ones. The clinical signs include loose, often bloody droppings, but death may occur without any noticeable symptoms. The character of the organisms found from the affected birds (ten turkeys, a hen, a partridge and a tree-sparrow) are described. Fermentation tests were made with 11 cultures, in which acidity was constantly produced in ramnose, xylose, dextrose, fructose, galactose, mannose, maltose, glycerin, mannite, salicin and arbutine; in certain cultures acidity was also produced in arabinose. All the cultures were pathogenic to g. pigs.

K. suggests that cold weather and parasitic invasion may act as resistance-impairing factors, infection occurring directly or indirectly from rodents.

MAISKIĬ, I. N. (1945.) O tipakh epidemicheskikh vspyshek tulyaremi. [Types of tularaemia epidemic.]—*Zh. Mikrobiol., Moscow*. No. 7-8. pp. 32-38. [Abst. in *Bull. Hyg., Lond.* 21. 306-307, copied *verbatim*. Signed: D. J. BAUER.] 2466

The author classifies epidemics of tularaemia into four types, and illustrates them with reference to the conditions in which they occur in Soviet Russia.

(1) *Occupational*, seen in hunters of the water rat (*Arvicola amphibius*), and caused by handling infected animals and skins. Epidemics of this type occur at the time of the spring floods, when the animals congregate on islands and high points and are consequently easy to catch.

(2) *Insect-borne*, the season depends on the vector concerned (summer, in epidemics spread by mosquitoes and horseflies). The bubonic type of case predominates, with ulcers at the site of the bite, usually on exposed parts of the body.

(3) *Water-borne*, characterized by a sudden massive outbreak among the population utilizing a water supply contaminated by infected water rats. Angina is a common feature.

(4) *Following epizootics*, three sub-groups are distinguished:—(a) *Agricultural*, the epidemic begins in October and is due to threshing ricks infested with infected rodents. Infection occurs by the inhalation of dust, giving rise to typhoid and pneumonic forms of the disease. This type of epidemic is commonest in Central Russia, being dependent upon the ecological distribution of *Microtus arvalis*. (b) *Domestic*, beginning in November, when infected rodents (*Mus musculus*) congregate in houses for shelter from cold; this type is commoner in South Russia. The disease is usually generalized and is often diagnosed at first as influenza. (c) *Trench*, occurring in

trenches and dugouts and generally resembling the domestic type. Preventive measures include the digging of ditches around field positions or surrounding them with ice walls to keep out the rodents.

WARRING, W. B., & RUFFIN, J. S., Jr. (1946.) **A tick-borne epidemic of tularaemia.**—*New Engl. J. Med.* **234**. 137–140. [Abst. in *Bull. Hyg., Lond.* **21**. 436, copied *verbatim*. Signed: R. LOVELL.] **2467**

An epidemic of 50 cases of tularaemia occurred amongst soldiers in a manoeuvre area in Tennessee from March to December 1943. All patients but one recovered. A definite history of a tick-bite before the onset of symptoms was established in 32 cases; five appeared to be due to direct contact with rabbits, and in 13 a history of a tick-bite was not obtained but was assumed. The ticks captured in the area were *Amblyomma americanum* and the authors concluded that this species was responsible for conveying infection to most of the patients. The onset of illness in half the cases was acute, and in all the symptoms commenced one to 21 days after the tick bite.

Primary ulcers were found on the upper and lower extremities, perineum, buttocks, lower abdomen and scapular regions. Enlarged regional lymph nodes were found in every case with an obvious primary lesion, and in three without one. The primary lesions healed in 4–7 weeks and convalescence was slow. The diagnosis was confirmed in all cases by agglutination tests, and treatment was non-specific.

WAYSON, N. E., McMAHON, M. C., & PRINCE, F. M. (1946.) **An evaluation of three plague vaccines against infection in guinea pigs induced by natural and artificial methods.**—*Publ. Hlth Rep., Wash.* **61**. 1511–1518. **2468**

Two of the vaccines were prepared from a North American ground squirrel strain. The organisms were killed by suspending them in 5% phenolized saline for 20 hours. The phenolized suspension was precipitated either with alcohol or with both alcohol and alum. The organism for the third vaccine was an Indian rat strain, prepared as for commercial use in 0.25% formalin in buffered saline.

The vaccines were given subcutaneously. After three weeks the g. pigs were subjected during one month to bites by fleas which had been infected by feeding them on animals in an advanced stage of plague septicaemia. The strain used to infect the fleas was heterologous to the strains used in the vaccines. In another series of experiments the challenge strain was injected subcutaneously in large doses.

It could be shown that the vaccines prepared

with the North American strain afforded a high degree of protection; the commercial vaccine was less effective. A typhoid vaccine given to a group of control animals protected them very slightly, which was taken as evidence that the protection through the plague vaccines was specific.

—A. MAYR-HARTING.

SIZOV, P. V. (1945.) Kolibatsillëzyne aborty u ovets. [Abortion in sheep due to colibacillosis.]—*Veterinariya, Moscow*. No. 1. pp. 23–24. **2469**

S. reports the results of a study made in the last few years of over 300 cases of colibacillosis on the sheep farms of the Karaganda State Farm. Amongst these were 48 cases of abortion, including 24 true abortions, 11 still births and 13 lambs that died soon after birth. A purulent metritis was the important lesion, with a vaginal exudate. It is stated that infection occurred by ingestion, by inhalation or through the skin.

Diagnosis and control are discussed.

—S. W. SALTER.

HEATLEY, N. G., & FLOREY, H. W. (1946.) **An antibiotic from *Bacterium coli*.**—*Brit. J. exp. Path.* **27**. 378–390. **2470**

Details are given of the isolation of an antibiotic, "colicine", from an atypical *Bact. coli* Type 1 (strain CF1) and of its properties. The authors think it unlikely to be of any chemotherapeutic value as it is fairly rapidly destroyed in the body and by some kinds of pus.—N. SABA.

CORDY, D. R., & DAVIS, R. W. (1946.) **An outbreak of salmonellosis in horses and mules.**—*J. Amer. vet. med. Ass.* **103**. 20–24. **2471**

Following a sea voyage and a week's rail journey, an outbreak of salmonellosis occurred in horses (six cases) and mules (two cases) in India in November, 1944. Seven animals died from the disease and one horse recovered out of a mixed lot of 300 horses and mules. The corral where the animals were kept had been previously used by animals of the Chinese Army.

The symptoms were fairly uniform, anxiety and depression being very evident, and were similar to those of the somnolent type of encephalomyelitis. The temperatures of the affected animals were 103.0°–105.6° F. and many animals became recumbent and unable to rise. Severe gastro-enteritis was present in all of the five animals (three horses and two mules) examined P.M.; four of these had died, but the fifth had been killed *in extremis* after an illness lasting 36 hours. In the two mules gastritis was more severe than in the horses: in the latter the caeca and colons were most affected. *S. morbificans* was isolated from the intestinal contents and the urine. One horse treated with sulphaguanidine recovered. Routine control measures were adopted and the

outbreak did not extend. Later, three mules out of a batch of 300 died in another part of India with symptoms and lesions very similar to those in the condition just described.—D. S. R.

MITCHELL, R. B., GARLOCK, F. C., & BROH-KAHN, R. H. (1946.) **An outbreak of gastroenteritis presumably caused by *Salmonella pullorum*.**—*J. infect. Dis.* **79.** 57–62. 2472

The outbreak involved 423 persons who had partaken of a meal of rice pudding containing eggs: 172 of those affected required hospital treatment. All had fever and most had diarrhoea, headaches, etc. Details could be obtained only from those who were treated in the hospital and of these 171 were known to have eaten the rice pudding served at three different meals and the remaining person was thought to have eaten some too. *S. pullorum* was isolated from 11.7% of the patients' stools. When the investigations began, none of the rice pudding or eggs could be found, nor could their source be traced.

Nevertheless, the authors conclude that the eggs must have been the cause and consider this to be the first reported large-scale epidemic of gastro-enteritis associated with *S. pullorum*.

—D. S. RABAGLIATI.

GERHARDT, P., & GEE, L. L. (1946.) ***Brucella suis* in aerated broth culture. I. Preliminary studies on growth assays, inoculum, and growth characteristics in an improved medium.**—*J. Bact.* **52.** 261–269. 2473

GEE, L. L., & GERHARDT, P. (1946.) ***Brucella suis* in aerated broth culture. II. Aeration studies.**—*Ibid.* 271–281. 2474

I. Preliminary to the preparation of a continuous culture for immuno-chemical studies, an examination was made of normal growth under optimum conditions of substrate and aeration. Aeration was obtained by incubating flasks in a reciprocating shaker apparatus. The techniques for the determination of turbidity, catalase activity, oxidation reduction potential, pH and plate count in broth cultures of *Br. suis*, were surveyed and modified. Statistical analyses and growth curves are given. The use of a heavy inoculum decreased the growth period and increased the yields, but the rate and extent of growth remained little affected. Differences in the age of the culture used for the inocula had no significant effects. Cultures from single colonies had no appreciable colonial variation or change of catalase activity after transfer for an extended period.

II. Aeration is one of the most important factors in the production of large amounts of *Br. suis*. The viable cell count generation time, as

well as the maximum yields, was used as an index of aeration efficiency. A reciprocating shaker apparatus gave an optimum and constant rate of air supply for broth cultures of *Br. suis*. Aeration by using an apparatus for introducing fine bubbles (here spoken of as a "sparger") through media gave results which varied according to the particular adaptation for releasing the bubbles (coarse grade sintered glass type, grade carbon type, improvised cotton muslin type or perforated stainless steel "dishpan" type) and the anti-foam agent necessary to control foaming.—S. J. G.

— (1947.) **Death after dog bite.**—*Lancet.* **252.** 602–603. 2475

The death of a boy in Hull from anaphylactic shock, following an injection of gas gangrene anti-serum given because of a deep punctured wound caused by a dog bite is reported. This is the third case from the same cause recorded in *The Lancet* within 12 months. The necessity of giving gangrene anti-serum and tetanus anti-serum in cases of dirty incised wounds is discussed, along with the reaction of the public to the possibility that rabies may occur after a dog bite.—D. S. R.

DINTER, Z. (1942.) **Kritički osvrt na laboratorijsku diagnostiku plinovitih edema. [Typing gas oedema clostridia.]**—*Vet. Arhiv.* **12.** 65–82. [Abst. from German summary.] 2476

Much of the work described covers matter that is well known. D. discusses the use of benzidine plate culture for differentiation between certain of the anaerobes, largely to avoid the expense of using g. pigs.

HOFFERBER. (1943.) **Ueber die Stachybotrotoxikose der Pferde. [*Stachybotrys alternans* infection in horses.]**—*Berl. Münch. tierärztl. Wschr. / Wien. tierärztl. Mschr.* August 6th. 262–264. 2477

This is a systematic description. The disease was first recognized as an entity in 1931–32 in the Ukraine where considerable losses in horse-kind were sustained. It was not until 1938 that the mould *Stachybotrys alternans* was known to be the cause. This organism lives on rotting plants such as wet hay, straw or thatch, and at one stage of life produces a toxin, so that horses ingesting contaminated fodder become affected with the characteristic intoxication, which manifests itself by haemorrhagic inflammation. The disease usually appears after harvest time and may occur throughout the winter. It has only been recognized in horses, although mankind is also said to be susceptible.

The typical form of the disease is an intense inflammation of all the alimentary tract commencing at the mouth and progressing towards

the rectum, the first symptoms arising from changes of the skin of the lips and mouth, then from the stomach and intestinal tract. If the amount of contaminated fodder is great the lesions develop into necrosis and death occurs from the effects of necrotic stomato-gastro-enteritis. In the most acute cases death can occur within 6 days of the appearance of the first symptoms. Sometimes death takes place in a state of shock (atypical form).

The P.M. findings, reflecting the nature of the inflammation, are described. The internal organs only have lesions arising secondarily from the digestive tract damage. In this disease coagulation of the blood is impaired and a test for this has a place in the diagnosis. Death losses can be prevented when the disease is diagnosed in time. Treatment is symptomatic and control based on removal of access to affected forage. Protective clothing for attendants is advocated.

—J. E.

MOORE, M. (1946.) Radiate formation on pathogenic fungi in human tissue.—*Arch. Path.* 42. 113-153. [Author's summary and conclusions copied *verbatim*.] 2478

The phenomenon of radiate formation usually associated with actinomycosis, and consequently termed the actinomycetoid form of radiation, has been observed on fungi in human tissue. It is commonly encountered in actinomycosis, frequently observed in coccidioid granuloma and occasionally noted in aspergillosis; it has been observed also in sporotrichosis, maduromycosis, paracoccidioid granuloma, chromomycosis and blastomycosis. Pathologic study of the mycoses with which the radiation effect is associated reveals that in all cases there is a granulomatous response of the tissue accompanied by a variable degree of suppuration, which is made manifest in some diseases, notably in actinomycosis and maduromycosis and to a lesser degree in coccidioid granuloma and aspergillosis, by the formation of sinuses. In all instances there is a marked inflammatory reaction of the tissue, with massing of leukocytes in close association with the radiate form.

The radiating structures vary somewhat in shape and size. They may be of the actinomycetoid type, i.e., in the form of clubs or rays with broadened tips; they may assume the form of prickles or crystalline needles, tubular in appearance; they may appear as somewhat flattened hyaloid extensions, doubly refractile, with "broken-off" tips and lateral angular projections, or they may be seen as peripheral nondescript, short extensions either partly or wholly surrounding the fungus. The unstained material is hyaloid,

crystalline or ground-glass-like in appearance and yellow to yellowish green in color. These rays stain pink with eosin and consequently have been referred to as acidophilic substance.

Radiate formation is not a specific characteristic of the genus or of the species but may be found associated, with a varying degree of frequency, with any mycosis which produces an inflammatory reaction in the tissue that tends to persist and consequently becomes chronic and results in a granulomatous response.

The nature and the source of the radiating substance have not been definitely established. Several theories have been advanced in this regard, and these briefly are as follows: 1. The radiating material is an aborted product of the fungus. 2. It is living protoplasm capable of multiplying. 3. It is the result of a host-parasite relationship—also a result of the digestive action of the host on the membrane of the fungus. 4. It is a protective mechanism set up by the fungus (a diffusion product). 5. It is an accompaniment of a reproductive process. 6. It is the result of an associated growth of certain bacteria. 7. It results from the allergic state established by the organism in the tissue. To these is added another possibility, namely, that the radiate substance may be similar or related to leukotaxine, described by MENKIN [see *V. B.* 11. 276].

In addition to radiate formation, other phenomena have been noted on fungi in human tissue. They consist of capsule formation as noted particularly on cells of *Cryptococcus* and *Histoplasma* and gloea formation, such as is found in hair infections (piedra and lepothrix). Also cell wall projections can be seen on various spores both in tissue and in culture.

CHUECA, P. (1946.) Acción bacteriostática y bacteriolítica de los Actinomyces del aire y del suelo. [*Bacteriostatic and bacteriolytic action of Actinomyces in the air and soil.*] pp. 48. La Plata: Facultad de Medicina Veterinaria, Universidad Nacional. 2479

C. isolated and identified 15 strains of saprophytic actinomyces from the air and soil. Species represented were *A. rutgerensis* (5), *A. viridochromogenes* (3), *A. griseoflavus* (2), *A. flaveolus* (2), *A. ochraceus* (1), *A. cellulosa* (1) and *A. albus* (1). None of the strains isolated had any bacteriostatic action on the Gram-positive and Gram-negative, sporing and non-sporing organisms, or the fungi used in the tests. Some, however, were able to dissolve dead bacilli, such as *Bact. coli*, *Staph. aureus* and *Corynebact. diphtheriae*, and dead fungi. This action apparently depends on the proteolytic ferment of the actinomyces group.

—I. W. JENNINGS.

MURPHY, J. M., & DRAKE, C. H. (1947.) **Infection of the bovine udder with yeastlike fungi.**
—*Amer. J. vet. Res.* 8. 43-51. 2480

The authors state that only one previous record of infection of the bovine udder with yeast exists in the literature. In a large experimental herd under constant supervision, ten naturally occurring cases of infection with a yeast-like fungus were observed over a period of six years. Generally, but not always, there was an accompanying swelling of the udder and there were macroscopic changes in the milk.

When a 1 : 400 dilution of a 24-hour culture of the organism, isolated from a cow three months previously, was inoculated into one quarter of a mastitis-free cow clinical mastitis developed in five days.

The authors discuss the identity of the yeast-like organism which they isolated from these cases.

After making tests to compare the strains with allied genera and other species of the same genus, the authors concluded that the organism was probably a new species of the genus *Trichosporon*.

—C. D. WILSON.

BAUDET, E. A. R. F. (1941.) Microsporidie bij het paard. [*Microsporidia in the horse.*]—*Tijdschr. Diergeneesk.* 68. 393-402. 2481

Extensive outbreaks of ringworm occurred in domesticated animals during the winter of 1940-41 and several veterinary surgeons experienced that the infection in cattle, due to *Trichophyton album*, was readily transmissible to man.

In horses ringworm was due to *Trichophyton equinum* and *Microsporum equinum*, the latter being very prevalent during the winter months of 1940-41. A clinical picture of the infection in horses is given and it is noted that the affected skin is dry in cases of microsporiasis while in trichophyton infection there is a vesicular dermatitis, exudation and scab formation.

Preparations for microscopic examination are dealt with in detail: lactophenol is preferred to 10% caustic potash solution as a clearing agent because it does not dissolve the hair and the disposition of the spores round the hair is more readily studied. The characters of *M. equinum* on artificial media are described and illustrated. Although microspora isolated from German army horses could be distinguished culturally from those recovered from Dutch horses they were considered to be only varieties of *M. equinum*. Further systematic investigations of the ringworms of domesticated animals are required; great care must be exercised when creating new species.

Treatment is discussed. The virulence of the organism and the resistance of the skin

influence treatment. A healthy, well cared for skin is a bad medium for skin parasites.

—P. L. LE ROUX.

THEISS, O. (1943.) Mikromyzeten und L-Kulturen. [*Micromycetes and L cultures.*]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 115. 2482

T. isolated filtrable organisms from the foetuses of horses, from vaginal secretions and uterine washings of horses and cattle, from cases of abortion in sheep, from a sample of milk and from dead chickens. His strains resembled those described by SEIFFERT (1936). A morphological similarity was also noted with the organisms cultured from mouse pneumonia by Herzberg. Classification of the various organisms found was not possible. It is assumed that, apart from saprophytic L organisms, pathogenic organisms exist, and it is suggested that this whole group of microbes be called *Micromycetes*, in agreement with Beller, and the diseases caused by them, micromycoses.—E. KLIENEBERGER-NOBEL.

MONOD, J. (1944.) Remarques sur le problème de la spécificité des enzymes bactériens. [*The specificity of bacterial enzymes.*]—*Ann. Inst. Pasteur.* 70. 60-61. 2483

It is claimed that the phenomena of "diauxie" (the power of some sugars of inhibiting bacterial enzyme action on a range of related substances), and of the adaptation of enzymes to a sugar when bacteria are grown in the presence of that sugar, can be explained by supposing that only one enzyme is involved, and not a series of specific enzymes.

It is suggested that all bacterial enzymes are derived from a common precursor which has a feeble and non-specific "pre-affinity" for certain sugars, this precursor consisting of a surface capable of fixing by adsorption the molecules of the substrates concerned, and that the molecules of this surface can be modified so that their activity in respect of adsorbed substances becomes exalted. When in contact with several substrates the precursor acquires polyvalent activity, except when its "pre-affinity" for one of the substances is very high, when the presence of that substance monopolizes it and inhibits its adaptation to other sugars. It is stressed that adaptation of enzymes only occurs when multiplication is taking place and growth is favoured.—U. F. RICHARDSON.

PIJPER, A. (1946.) **Shape and motility of bacteria.**
—*J. Path. Bact.* 58. 325-342. 2484

Observing the movements of bacteria which are slowed down in solutions of gelatin or gum and especially in solutions of "methocel" (methylcellulose), P. concludes that organisms commonly described as rods are really spirals and that they move by gyratory movements of

the body. The flagella are not organs of motility, but only deformations of the slimy layer surround-

ing the bacteria and are the result of the bacterial movements.—A. MAYR-HARTING.

See also absts. 2512 (streptococci and strangles); 2522 (*B. coli*); 2531 (*Br. abortus agglutinins*); 2535 (TB. sensitivity); 2577, 2578 (numerous bacterial infections); 2583 (*B. coli* and salmonella in calves); 2615, 2616 (mastitis); 2619 (*Haemophilus influenza*); 2624 (leptospirosis); 2633 (anterotoxaemia in lambs); 2639 (thermoduric bacteria); 2644 (staphyl. food poisoning); 2645 (contaminating eggs); 2654 (anaerobes); 2662-2675 (reports covering many infections); 2676 (textbook).

DISEASES CAUSED BY PROTOZOAN PARASITES

GALLO, P. (1946.) Estudios inmunológicos sobre *Trypanosoma Venezuelensis*. [Immunological studies with *Trypanosoma venezuelense*.]—*Rev. Med. vet. Parasit., Caracas*. 5. 45-52. 2485

Attempts to demonstrate toxin in dried trypanosomes or extracts of trypanosomes gave negative results and although sera of infected animals gave low titre agglutination with trypanosome suspension, non-specific agglutination was also given with normal horse serum. Complement-fixation tests gave irregular results and the intrapalpebral test proved unsatisfactory. Some encouraging results were obtained in respect of precipitins in sera of infected horses and further work on this is proposed.

Attempts to produce active immunity with dried trypanosomes and trypanosome extracts gave negative results, but evidence of the occurrence of ablastin was obtained; some success in reducing the severity of equine disease was obtained by passing the trypanosome through goats.—U. F. RICHARDSON.

KEFJANI, O. (1947.) The antigenic composition and the effect of various extracts of *Trypanosoma equiperdum* and *Trypanosoma lewisi* on the leucocyte picture in experimental trypanosomiasis.—*Amer. J. Hyg.* 45. 144-149. 2486

On analysis of trypanosomes of the species *T. equiperdum* and *T. lewisi*, six fractions were obtained: (a) alcohol-soluble at 37°C., (b) ether-soluble, (c) chloroform-soluble, (d) proteic substance 1 (extracted with 75% alcohol at 100°C.), (e) proteic substance 2 (precipitated with 50% alcohol) and (f) the residue. The lipid content was greater in *T. equiperdum* and the residue in *T. lewisi*. On injection into normal rats all the fractions produced an elevated leucocyte count, whilst infected rats did not have this response and their leucocyte counts sometimes fell.

It is concluded that the response of an infection to drug treatment does not depend on the lipid content of the trypanosome, nor, probably on its antigenic composition, and that the failure of infected rats to respond to antigenic material is probably due to exhaustion of the reticulo-endothelial system which is unable to increase the monocyte output.—U. F. RICHARDSON.

CAPORALE, G. (1946.) Il morbo coitale maligno. [Dourine.]—*Clin. vet., Milano*. 69. 23-32. 2487

A good, short, account is given of the epidemiology, symptoms and lesions of dourine and the methods of diagnosis and treatment. For control measures a census of equines is recommended in clean areas, with inspection of imported animals and regular inspection of stallions. In infected areas the use of artificial insemination is recommended, with prophylactic treatment of stallions and the slaughter of infected animals of low value.

The regulations governing control measures include compulsory notification of disease, isolation of suspected animals, veterinary inspection of breeding stock with powers to treat infected animals and for their marking or castration. The compulsory slaughter of infected animals is not contemplated.—U. F. RICHARDSON.

NIŽNÁNSKY, F. (1946.) O trichomonádovej nákaze hovädzieho dobytku so zvláštnym zreteľom na Slovensko. [Trichomoniasis in cattle in Slovakia.]—*Čas. československ. Vet.* 1. 135-141. 2488

Since 1943 trichomoniasis in cattle has been a notifiable disease in Slovakia. In the period 1939-45, according to the statistics of the State Diagnostic Veterinary Institute in Bratislava, there were no cases of the disease in the country. As a result of extensive movement of domestic animals after the war, the disease may be expected to spread.

N. gives a review of the literature dealing with the morphology, aetiology, diagnosis, therapy and control of trichomoniasis in cattle.—E. PRYBYL.

RUMYANTSEV, N. V., & BAĬDALIN, A. Y. (1940.) Opyty iskusstvennovo pereneseniya na korov i bykov Trichomonas foetus. [Transmission of *Trichomonas foetus* to cows and bulls.]—*Veterinariya, Moscow*. No. 4. pp. 123-126. [French summary.] 2489

After intravaginal injection with the vaginal washings of a cow with trichomonad infection, four cows under experiment developed a nodular vaginitis and a trichomonad infection of the vagina, although no invasion of the uterus could be detected, and two pregnant animals did not abort. Four bulls, in which the same material was injected into the preputial sac, developed an inflammation of the mucous membrane of the prepuce, and in some animals there was painful swelling of the penis, but only in one animal were

trichomonads detected in the preputial secretion.

—U. F. RICHARDSON.

HERRICK, C. A., & EDGAR, S. A. (1947.) **Some relationships between cecal function and coccidiosis of chickens.**—*Poult. Sci.* 26. 105-107. 2490

The caecal contents of chickens (month-old, parasite-free, single-comb White Leghorns) were discharged several times each day, but no caecal faeces were passed between 8.30 p.m. and 5.0 a.m. A greater quantity of caecal droppings was passed just before and following the sleeping hours of the chickens.

The functioning of the caeca appears to be closely correlated with the degree of infection by caecal coccidia. In severe infections only a few caecal droppings were passed on the fourth day and none after this until the caecal cores were expelled some 17 days after cessation of normal function. In some individuals the cores were retained for more than a month and no caecal droppings were passed during this period. The caeca began to function normally immediately after the discharge of the cores. In cases in which one caecum was protected from infection by the use of a drug, it functioned normally even when the other had ceased to function owing to the presence of a core.—C. HORTON SMITH.

MOREHOUSE, N. F. (1945.) **The occurrence of *Haemoproteus* sp. in the domesticated turkey.**

—*Trans. Amer. micr. Soc.* 54. 109-111. 2491

P.M. examination of a turkey poult showed that it was heavily parasitized by *Haemoproteus* sp. The owner of the flock from which the poult was received reported that although the birds were feeding well they were becoming progressively emaciated. Examination revealed an anaemic condition. In blood smears stained with Wright's stain, male and female *Haemoproteus* were present, and 25 specimens of each were drawn with the aid of a camera-lucida. Adult female gametocytes had a mean size of $16.63\mu \times 3.28\mu$, were crescentic in form, and occupied about $\frac{1}{2}$ – $\frac{3}{4}$ of the host cells. The surfaces of the parasites usually lay in close contact with both the erythrocyte walls and their nuclei. The adult male gametocytes had a mean size of $15.58\mu \times 3.40\mu$. The gametocytes were generally confined to the erythrocytes, but on several occasions extra-cellular forms resembling female gametocytes were seen. [Although M. suspects this as being a new species he refrains from naming it until more knowledge of its life cycle and host specificity is available.]

—C. HORTON SMITH.

SILVA LEITÃO, J. L. (1945.) "*Piroplasma caballi*" (Nuttall e Strickland, 1910) em Portugal. [*Equine piroplasmosis in Portugal.*]

—*Repos. Lab. Pat. vet., Lisboa.* 6. 145-151.

[English, French and German summaries.] 2492

A case of equine piroplasmosis due to *Babesia caballi* is recorded at Loures in Portugal, the animal having been brought into the area about a month previously. It is suggested that the equine population of Loures carries the infection which is transmitted by one of the local ticks (*Hyalomma dromedarii* and *Rhipicephalus bursa*).

—U. F. RICHARDSON.

KURCHATOV, V. I., & MARKOV, A. A. (1940.)

Ustanovlenie perenoschika piroplazmoza svinej.

[Transmission of porcine piroplasmosis.]—

Veterinariya, Moscow. No. 2. pp. 63-65.

[French summary.] 2493

Attempts to transmit *Babesia traubmani* of swine with ticks of the species *Hyalomma marginatum*, *Rhipicephalus sanguineus*, *Rh. rossicus*, *Rh. turanicus* and *Dermacentor silvarum* gave negative results, but successful infection was effected at the end of 1939 with the progeny of two engorged female *Rh. turanicus* sent in from an infected area. The larvae and nymphs were fed on rabbits, the successful infection being conveyed by imagoes of the next generation, showing that hereditary transmission was involved.

In discussion of the seasonal and regional distribution of tick species, it is pointed out that *Rh. turanicus* becomes numerous before the seasonal appearance of swine piroplasmosis, but that a similar phenomenon occurs in the case of ticks transmitting equine and bovine piroplasmoses. The seasonal and regional distribution of *Rh. rossicus* agrees closely with that of swine piroplasmosis and suggest this tick to be a carrier of the disease. The other species which have been under investigation do not appear to be involved.

—U. F. RICHARDSON.

BABUDIERI, B. (1939.) *Leptospira oryzei* agente

di una nuova leptospirosi italiana. [*Leptospira*

oryzei, causal agent of a new type of leptospirosis in Italy.]—*Riv. Parassit.* 3. 93-111.

[English, French and German summaries.] 2494

B. records the isolation of a strain of leptospira from cases of mild fever, headache and muscular pain in human beings in the Po valley, by the inoculation of blood into a g. pig and subsequent cultivation in Reiter's and Vervoor's media. The organism had little pathogenicity for g. pigs and could not be recovered from inoculated rats and rabbits, but caused a febrile reaction in monkeys. Serological investigations by agglutination tests, and tests by culture in immune sera, indicated that it was distinct from *L. icterohaemorrhagiae*, *L. canicola*, *L. grippo-typhosa*, *L. autumnalis*, *L. hebdomadis* and *L. aquicola-biflexa*. The name *Leptospira oryzei* is suggested for the organism,

though it is admitted that it may be identical with *L. bataviae*.—U. F. RICHARDSON.

I. STUHLFAUTH, K. (1943.) Bericht über ein neues schlammbieherähnliches Krankheitsbild bei Deutschen Truppen in Lappland. [Report of a new disease resembling mud fever among German troops in Lapland].—*Dtsch. med. Wschr.* 69. 439-443 & 474-477. 2495

II. STUHLFAUTH, K. (1943.) Nachtrag zu dem "Bericht über ein neues schlammbieherähnliches Krankheitsbild bei deutschen Truppen in Lappland". [Addendum to I.].—*Ibid.* 605. 2496

I. A description is given of a disease which occurred amongst German troops in Lapland in 1941-42, suggestions being made as to its nature and epidemiology. The disease was characterized by shivering fits, fever, lowered blood pressure and pain in various parts of the body. The liver and spleen were enlarged and kidney damage was indicated by considerable albuminuria. Vision was also affected by an alteration in the curvature of the lens. Recovery usually occurred within 14 days.

The Finnish authorities had no knowledge of the disease, which did not appear to be transmitted from man to man. Cases were confined to certain marshy localities and had a seasonal prevalence which coincided with the spring appearance of mice and the Lapland marmot, the disease disappearing about August.

It is suggested that it was a leptospirosis derived from water contaminated by the urine of rodents, and that it disappeared in the summer owing to the action of the sun.

II. A further note records that the disease did not reappear in 1943, that year differing from 1942 in that no large numbers of marmots were present. Apparently this animal is not usually numerous in the district concerned and only occurs there in large numbers under exceptional conditions.—U. F. RICHARDSON.

STUART, R. D. (1946.) The preparation and use of a simple culture medium for leptospirae.—*J. Path. Bact.* 58. 343-349. 2497

The medium described consists of 2 vol. dextro-rotary asparagine, 10 vol. NH_4Cl , 4 vol. MgCl_2 , 66 vol. NaCl , all of M/10 concentration, 1 vol. glycerin A.R., 1 vol. 0.02% solution of phenol red in distilled water, and 91 vol. distilled water. The ingredients are measured into a screw-cap bottle with a 10 ml. pipette which is rinsed with boiling water between each operation. The mixture is steamed for 30 min. to drive off CO_2 . At the same time 20 ml. of Sørensen's buffer solution pH 7.6 is also steamed. 16 ml. of the buffer mixture are added to the medium and

the whole sterilized by resteaming for an hour. For use, 2-3 ml. of the medium are pipetted carefully into washed tubes and 5-10% rabbit serum added; the completed tubes are placed in a water bath at 60°C. for an hour. It is emphasized that all glass-ware must be scrupulously clean, since even a trace of soap is lethal to leptospirae. Occasional rabbit sera are useless and these must be eliminated by trial. The inoculum should be heavy, about 0.5 ml. of a well-grown culture into 3 ml. of medium.

It is claimed that the medium is as good as others in common use and has the advantage that it is simple to make, 200 ml. of the basic medium being prepared in 10 min., and can be kept in stock. Phosphatic precipitation does not occur. The use of glycerin delays for several minutes the drying of loopfuls of culture. The use of g. pig instead of rabbit serum makes it satisfactory for the maintenance of stock cultures which can be successfully subcultivated after 3-6 weeks at room temperature.—U. F. RICHARDSON.

— (1946.) [Discussion on] Leptospirosis with special reference to its occurrence in the dog. [Speakers:—HEATHER, E. J., & WYLIE, J. A. H.]—*Vet. Rec.* 58. 357-358. 2498

HEATHER drew attention to the rat infestation of the waterways of Oxford, to the danger of leptospirosis and to occurrence of leptospirosis not associated with jaundice, but admitted that he diagnosed canine infection only when jaundice could be observed. WYLIE, giving a short account of leptospirosis in Great Britain and the importance of canine infection, said that there appeared to be no record of the occurrence of *L. canicola* in man and considered that STUART [V. B. 17. 15] accepted rather low agglutination titres as significant. The serum of some insusceptible animals which had never been exposed to leptospirae contained non-specific agglutinins detectable in high dilution. Animal inoculation often gave false negative results on account of the poor viability of leptospira, and the serum agglutination test should be used in investigating the prevalence of canine leptospirosis, diagnosis being considered before jaundice developed, as a large proportion of cases may be anicteric. In answer to questions, WYLIE stated that infection was more common in the brown rat than in the black and that the rat was far the most important carrier, although certain other small rodents carried leptospirae.

—U. F. RICHARDSON.

LAUNOY, L. (1944-45.) L'albuminurie de la trypanosome expérimentale à *T. amamense* du lapin: action des agents trypanocides. I. Action de moranyl employé seul. II. Action de la synergie moranyl-anthiomaline. [Albu-

minuria due to *Trypanosoma annamense* infection in rabbits; action of trypanocidal agents. I. Action of moranyl alone. II. Action of moranyl and anthiomaline in co-operation.]—*Bull. Soc. Path. Exot.* 37. 347-359 & 38. 275-278. 2499

I. It is pointed out that the albuminuria which occurs in sleeping sickness has been ascribed by some authorities to the action of the trypanosomes, and by others to the action of the moranyl [antrypol] used in treatment. Tests of the action of moranyl on healthy rabbits showed that it caused a delayed albuminuria and an oligouria which could to some extent be explained by inappetence.

In rabbits infected with *T. annamense* [= *T. evansi*] albuminuria is a constant feature and coincides with the appearance of oligouria,

See also absts. 2580, 2622, 2623 (piroplasmosis); 2621, 2625 (trypanosomiasis); 2656 (staining technique); 2668-2675 (reports).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

HEDIGER. (1940.) Ueber Maul- und Klauen-seuche bei Zootieren. [Foot and mouth disease in zoological gardens.]—*Zool. Gart., Lpz.* 12. 298. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Oct. 29th. 386. (1943).] 2500

Foot and mouth disease affected animals in the Dählhölzli Zoo, Berne, in December, 1938. Eleven bison and twelve ibex were affected, but deer, chamois and wild boars in the immediately adjoining enclosures remained normal. The bison, although severely affected, recovered, the three pregnant cows later calving normally. The young ibex were only mildly affected. One affected goat died after an illness lasting 36 hours.—E. COTCHIN.

MICHELSSEN, E. (1946.) Orienterende Interferens-forsøg med Mund- og Klovesyggevirus. [The interference phenomenon with foot and mouth disease virus.]—*Maanedsskr. Dyrlæger.* 58. 346-358. 2501

After a review and discussion of the interference phenomenon, M. describes experiments carried out at the F. & M. disease research station at Lindholm. These experiments were prompted by the casual observation of a case of apparent interference, in which a field virus of A type was inoculated as usual into the foot of a g. pig without any reaction developing within 24 hours, and a second injection of a known g. pig-virulent A virus was then made, also without the slightest reaction. In the first experiment, g. pigs were inoculated intradermally or intraperitoneally with a bovine O virus attenuated by heating for 10 or 15 min. to 60°C.; one, six or 24 hours later the same but unattenuated virus was inoculated intradermally.

A full reaction with generalization occurred

but treatment with moranyl rapidly dispels it, as it does the other symptoms of trypanosomiasis.

II. A rabbit infected with *T. annamense* and having considerable albuminuria was treated with anthiomaline intramuscularly and moranyl subcutaneously, which resulted in a big rise in the urine protein content and a fall in the total urine output. Re-treatment on the third and sixth days again caused slight rises in the urine proteins, but the quantity of urine returned to normal. Three days after the last treatment the albuminuria disappeared. It is suggested that the big rise in urine protein after the first treatment may be due to the destruction of trypanosomes by the anthiomaline and the excretion of disintegration products in the urine.—U. F. RICHARDSON.

in most cases, but some animals inoculated at six or 24 hours developed only a local reaction. In a further experiment g. pigs were inoculated intraperitoneally with attenuated virus and then injected three times, one, two and six hours later (intradermally, intraperitoneally and intraperitoneally respectively). 30% of a group given virus attenuated for 15 min. and 80% of a group given virus attenuated for 10 min. were protected against generalization. These were not instances of ordinary immunity, because when the animals were injected with virus one week later, all reacted with generalization.

In another experiment, g. pigs were inoculated intraperitoneally with O virus which had become naturally attenuated by four passages in bovine brain tissue culture, and one, two and six hours later injected with ordinary O virus (as in the first experiment). Six out of ten animals were protected against full reaction with generalization. It was known that this culture virus could not have produced immunity.

In similar experiments influenza virus was found not to cause any interference with F. and M. disease virus.

In order to find out whether different virus types interfered with each other and whether one type was dominant over another, g. pigs were inoculated both intradermally and intraperitoneally with virus of one type (A or O) and 24 hours later by virus of the other type, by the same routes. One week later blood was obtained by cardiac puncture and examined for the presence of immune bodies against virus. Animals inoculated first with O and then with A virus had a much higher anti-O than anti-A titre, but animals inoculated with A before O virus had an equally high titre

against both types. A third group of g. pigs which received virus A and O simultaneously was shown to have a slightly higher anti-O titre. These results seem to indicate that type O virus is dominant over type A.

These results are described as preliminary, to be judged against further work on a larger scale.

—J. E.

GARD, S. (1944.) Några virusproblem i den moderna forskningens ljus. [Some virus problems in the light of modern research.]—*Skand. VetTidskr.* 34. 329–351. [Abst. from English summary.] 2502

The principles of the electron microscope are described, together with its capacity and restrictions. The limit of magnification given by standard instruments is about 40,000.

Most plant viruses appear in the form of long fine rods or fibres. The bacteriophages are ellipsoid or egg-shaped and often reminiscent of spermatozoa with an egg-shaped head and a long thin tail, the latter being an organ for attachment.

The viruses pathogenic for animals have distinct forms: cubes or short parallelepipeds with rounded corners and edges (*e.g.*, the viruses of the variola-vaccine group, molluscum contagiosum, rabbit myxoma, etc.), spherical or irregular polygonal bodies (*e.g.*, the viruses of zoster, varicellae and herpes) or very small spherical bodies about 10 m μ in diameter (*e.g.*, the viruses of influenza and foot and mouth disease). The poliomyelitis virus, on the other hand has a striking resemblance to certain plant viruses, notably the potato X-virus.

A group of infective agents formerly looked upon as typical viruses will probably now have to be reconsidered, *e.g.*, the causes of trachoma, conjunctivitis, psittacosis, virus broncho-pneumonia in rats and mice, lymphogranuloma inguinale and probably also fowl paralysis. The group is characterized by a so-called initial body, spherical 0.1–0.2 μ in diameter which makes its way into the cell, where, having grown into a basophilic inclusion body varying in size, it splits up into a large number of fragments (the morula stage) in which a great number of acidophilic initial bodies develop. This group can be effectively treated with sulphonamide preparations which are ineffective in other virus diseases.

All the viruses are nucleoproteins, the nucleic-acid constituting only 5% of the molecule.

There are 11 illustrations, two of which show the electron microscope and one of which shows an air-driven centrifuge of Beam's model, and six electron microphotographs showing various viruses including mosaic, dysentery bacteriophage, molluscum contagiosum and poliomyelitis.

HENLE, G., & HENLE, W. (1946.) Studies on the toxicity of influenza viruses. I. The effect of intracerebral injection of influenza viruses.—*J. exp. Med.* 84. 623–637. 2503

HENLE, W., & HENLE, G. (1946.) Studies on the toxicity of influenza viruses. II. The effect of intra-abdominal and intravenous injection of influenza viruses.—*Ibid.* 639–660. 2504

I. The toxic properties of influenza virus were studied using the PR 8, WS, F-12, F-99 and Weiss strains of influenza A, the Lee strain of influenza B and the S-15 strain of swine influenza. The strains were passaged by the allantoic route in ten-day chick embryos and in mice by intranasal instillation. The toxicity of virus suspensions was tested by intracerebral injection of mice, rats, g. pigs and hamsters with massive doses of virus. These injections led to tonic and clonic convulsions and death in tetany, usually within 24–72 hours. The predominant finding on histological examination was destruction of the ependymal lining of the ventricles. Injection of control materials, free from virus, gave negative results. Attempts to passage the virus strains by the intracerebral route were unsuccessful, transfers being made at short intervals, and it was concluded that the neurological reactions were due to a toxic action of the virus and were not associated with propagation.

II. The toxic effect of influenza virus on other organs and tissues which do not usually support multiplication of this infective agent was studied by intravenous and intraperitoneal injections of mice, rats, g. pigs and rabbits. Death frequently occurred within 8–96 hours, all strains producing hyperaemia and focal necrosis of the liver, and hyperaemia and destruction of the Malpighian bodies of the spleen. In addition the F-99, F-12, PR 8 and WS strains of influenza A caused engorgement of the blood vessels of the intestine with blood-stained mucous material in the lumen, whereas the Lee and ES strains of influenza B caused the appearance of large amounts of pleural exudate. There was no evidence to indicate multiplication of the virus in the liver or the peritoneal cavity. The toxic activity of the virus could not be separated from its infective properties. Specific immune sera neutralized the toxic activity of the homologous virus. Mice could be protected against the toxic effects of intraperitoneal and intravenous injection of virus by vaccination by the subcutaneous or intraperitoneal routes. The authors suggest that the toxic activity of the virus may play an important part in the pathogenicity of influenza in man.

—W. M. HENDERSON.

SLAVIN, H. B., HALE, H. W., Jr., & BERRY, G. P.

(1946.) **Passive protection of the central nervous system of mice against viruses that pursue the pathway of the olfactory nerves after intranasal instillation. Vesicular stomatitis and St. Louis encephalitis.**—*J. Immunol.* **54.** 179-188. 2505

Passive immunity, naturally acquired by sucking actively immunized mothers or artificially conferred by the injection of a foreign antiserum, protected the central nervous system of two-week-old mice against infection by intranasally instilled vesicular stomatitis (Indiana strain) or St. Louis (Freeman strain) viruses, both of which in mice pursue the olfactory pathway exclusively to reach the c.n.s. from the nasal mucosa. The experiments in which mice were passively immunized by sucking immune foster mothers suggested that when the dose of virus was kept constant, resistance was at least in part a function of the quantity of circulating antibody available; this was supported by experiments on artificial passive immunity using foreign antisera of different *in vitro* neutralizing capacity.—E. COTCHIN.

*KAISER, M. (1943.) Ist es möglich, die technische Herstellung von Lyssaimpfstoffen zu vervollkommen? [**Is it possible to improve the technical preparation of rabies vaccines?**]—*Wien. klin. Wschr.* pp. 507-508. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)*. **144.** 511.] 2506

A modification of Hempt's ether-carbol-glycerin vaccine, omitting the phenol and glycerin, is described. A fine brain suspension is shaken with ether, inactivation of the virus being completed with iodine vapour if necessary. The vaccine is preserved dry in ampoules which may contain single doses and which are resuspended in saline as required.—E. COTCHIN.

*SUGITA, Y., SUGITA, S., & SUGITA, A. (1940.) Weitere Studie über das Wesen der Prowazek-schen Körperchen und anderer Einschlusskörperchen, insbesondere über künstlich mittels Kuhpockengift erzeugte Körperchen. [**Studies on Prowazek bodies and other inclusion bodies with special reference to artificially produced cowpox inclusions.**]—*Arch. Ophthal.* **106.** 428-436. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)*. **142.** 198.] 2507

As a result of their investigations, the authors are of the opinion that the inclusion bodies are coagulated protein granules.—E. COTCHIN.

*HARDER, H. U. (1942.) Seuchenkarte der Pferdesterbe in Afrika. [**Disease map of African horse sickness.**]—*Inaug. Diss., Hanover.* [Abst. from absts. in *Dtsch. tierärztl. Wschr.* **50.** 472 and *Zbl. Bakt. I. (Ref.)*. **144.** 13-14.] 2508

Sketch-maps showing the distribution of African horse sickness indicate that the disease

occurs chiefly in the eastern half of the African Continent, beginning in the north on both sides of the Nile at about 27°N., and extending south to the Cape Province. Especially affected are the southern regions of Kenya and the north-east of Tanganyika, as well as the Transvaal, Natal and the south-east of the Cape Province. On the west coast, the disease is most prevalent in South-West Africa and certain coastal regions of Angola and in Senegal. Isolated outbreaks have been demonstrated in French Guinea, in the south of the Gold Coast and in the north of Nigeria. Of the former German colonies, Tanganyika (especially the coastal regions) and South-West Africa (especially inland) are widely affected, while Togoland and the Cameroons are free of the disease. In Central Africa, African horse sickness occurs in parts of the Belgian Congo. Outside Africa, the disease occurs only in southern Arabia.—E. COTCHIN.

DE VRIES, J. P. (1942.) Exanthema coitale bij paarden. [**Coital exanthema in horses.**]—*Tijdschr. Diergeneesk.* **69.** 412-413. [German summary.] [For previous article, see *V.B.* **14.** 270.] 2509

The results of a study of pregnancy in horses following service by stallions which were infected with exanthema coitale are reported.

During the incubation period two stallions served 51 mares, of which 31 undoubtedly became infected. Of these 51 mares, 31 % became directly pregnant and 39 % after repetition of service; 30 % remained barren.—R. PETER JONES.

BRION, A. (1945.) Encéphalites équines. [**Diseases of the central nervous system of horses.**]—*Rev. Path. comp.* **45.** 245-248. 2510

A brief review is given of the infectious and non-infectious encephalomyelitic diseases of horses in which B. records that Borna disease has not appeared in France during the war, in spite of the large movements of horses that have taken place. Horses imported from America in 1939-40 had all been vaccinated against equine encephalomyelitis and the disease has not been reported in France. The non-infectious encephalitis given most attention is the encephalo-hepatitis syndrome, which B. compares to degenerative lenticular hepatitis of man.—W. M. HENDERSON.

I. GRATZL, E. (1944.) Die Pathogenese des ansteckenden Katarrhs der Luftwege und der Drüse des Pferdes. [**Pathogenesis of equine infectious bronchitis and of strangles.**]—*Z. Veterinärk.* **56.** 201-211. 2511

II. GRATZL, E. (1944.) Kritische Betrachtung der Prophylaxe und Therapie des ansteckenden Katarrhs der Luftwege und der Drüse auf Grund ihrer Aetiologie und Pathogenese. [**Critical considerations on the prophylaxis and**

therapy of equine infectious bronchitis and of strangles with regard to their aetiology and pathogenesis.]—*Ibid.* 265–278. 2512

I. In observations on army horses with infectious bronchitis, G. often noticed an intermittent nasal discharge, which sometimes occurred weeks after clinical recovery. He examined 90 horses in various stages of the disease with an endoscope and by X-ray and carried out tonsillectomy on 40 [no technical details]. From his observations on different parts of the upper respiratory tract he suggests that the pathogenesis is as follows:—

The condition is initiated by a filtrable virus and developed by a Group C streptococcal infection, which may be of endogenous origin, from a latent saprophytic infection, or exogenous, from an in-contact animal.

The first part to become inflamed is the ethmoid labyrinth and infection is spread aerogenically from it to the nasal cavity as a whole, to the nasal accessory sinuses, palate and pharynx. The guttural pouch is also often infected and when this occurs there is lymphogenous spread of infection to the adjacent lymph nodes of the throat region. Infection of the trachea, bronchi and lungs arises through the movement of pus formed in any of the sites referred to above; if a broncho-pneumonia occurs, there is haematogenous spread of infection from the lungs to other organs of the body [see *V. B.* 15. 330].

Owing to the anatomical structure, this complex infection tends to persist and become chronic, with empyaema of the nasal conchae, accessory sinuses and guttural pouches, and to manifest itself by intermittent nasal discharge. Horses which had infectious bronchitis need thorough examination to ascertain whether empyaema is present or not, and some require appropriate treatment.

II. Environmental factors are first discussed. Infectious bronchitis is most likely to occur in horse depots, where close contact occurs. Contrasting instances are given. Horses in racing stables and kept in individual horse boxes opening by the common two part doors on to a court did not develop respiratory disease, in contrast to horses in large stables and less separated from each other. In Southern France it was found that hot weather favoured the disease and that a change to wet cold weather apparently checked it. G. is of the opinion that sunshine in abundance acted unfavourably on horses kept in a large well-lighted stable.

The problem of protective inoculation is discussed. Neither for infectious bronchitis nor for strangles has an effective vaccine yet been made. In the latter disease, G. considers that a "*Str.*

pyogenes animalis" is the causal agent. Treatment is of two kinds, attention to general hygiene (shelter, ventilation, good food and general nursing) and specific therapy. Sulphonamides are the best remedy for the acute infective stage, but local treatment to remove pus is also needed, by syringing and drainage with surgical aid. [Penicillin would now be the drug of choice.]

—J. E.

ANON. (1946.) Včc: Infekční bronchopneumonie skotu (chřipka skotu)—výroba očkovací látky. [Bovine infectious broncho-pneumonia: vaccine production.]—*Čas. československ. Vet.* 1. 79–80. 2513

Veterinarians are advised in the case of bovine contagious broncho-pneumonia to send the head and lungs of the slaughtered animal to the Veterinary Diagnostic Institute for the production of an autogenous vaccine. Strict isolation of newly purchased animals is necessary because outbreaks most frequently occur after the introduction to farms of newly purchased animals with latent infection. The isolation of animals should last 2–4 days.—E. PŘIBYL.

DONATIEN, A., PLANTUREUX, E., RAMPON, L., & GAYOT, G. (1946.) L'immunisation contre la peste porcine. [Immunization against swine fever.]—*Arch. Inst. Pasteur Algér.* 24. 87–103. 2514

The authors describe and discuss the methods and results of inoculations against swine fever, carried out in Algiers.

The virus strain used for the vaccines was isolated in Morocco in 1943 and has been found to be very stable. As the strains causing the disease in various parts of France and North Africa do not seem to differ serologically, the authors believe that the use of the vaccine need not be restricted to North Africa. The pigs are bled on the 8th–9th day after inoculation; 1 ml. in a dilution 1:10 of this blood will regularly transmit the disease.

Antiserum is prepared by injecting the animals with 1 ml. of 1:20 diluted virulent blood and 2 ml. of antiserum per kg. This injection is followed by a course of increasing amounts of virulent blood without antiserum, finishing up with 200 ml. of blood intraperitoneally and three subcutaneous injections of suspensions of organs from infected animals. The blood obtained a fortnight after the last injection is defibrinated, filtered and centrifuged. Phenol 0.5% is added to the serum.

The actual immunization is done in different ways, depending on whether the herd is infected or not. In an infected herd the animals with

clinical signs of the disease are killed and the temperature of the others is taken; those with a rise of temperature receive antiserum only, 1.5 ml. per kg. weight. Animals with normal temperature receive the combined serum-vaccine treatment. Serum-vaccine is used in herds free from infection. It consists in injecting subcutaneously 1 ml. of antiserum per kg. and simultaneously, but in a different place, 1 ml. of 1:10 diluted virulent serum. The authors suggest vaccination of the animals at the same time against swine erysipelas, swine pasteurellosis, and salmonellosis. The symptoms of these diseases resemble one another closely and if animals vaccinated against swine fever contract any of the other diseases the breeder may note this as a failure of the vaccination. A grave problem in this connexion is presented by swine influenza; latent influenza infections may flare up after the vaccination and may spread through the herd. It is advisable, therefore, to abstain from the vaccination in an area where swine influenza occurs, particularly during the winter. The animals that are vaccinated ought to be kept under very good conditions of diet and accommodation. The best age for vaccination is 3-4 months. At that age the animals do not give any reaction. Moreover the weight of such small animals permits noticeable economies in serum.—A. M.-H.

CARLSTRÖM, B., & NILSSON, S. A. (1944.) En ny form av valpsjuka. [A new form of dog distemper.]—*Skand. VetTidskr.* 34. 352-356. [Abst. from English summary.] 2515

A new form of distemper is described which first appeared in Sweden in 1943, following some two and a half years' almost complete freedom from the disease. Dogs of all ages were attacked, whether they had previously had distemper or not and even if they had been vaccinated.

The symptoms were similar to those of the known form of distemper, except for an insidious initial stage when rise of temperature, if any, was slight and catarrhal symptoms were also slight; nervous symptoms predominated. Laidlaw-Dunkin's serum was ineffective.

The authors consider this new form to be caused by a variant of distemper virus and recommend the preparation of sera and vaccines that will be effective for both forms of the disease.

KIRK, H. (1946.) Some canine and feline disease problems.—*Vet. Rec.* 58. 219-221. Discussion pp. 222-223. 2516

K. began by discussing the methods of immunization against canine distemper and the relative advantages and disadvantages of these methods. Explanations of some of the breakdowns were given. The aetiology of canine

hysteria was discussed and this was followed by a description of feline enteritis and feline distemper together with details of diagnosis and treatment.

HEWETSON opened the discussion and he and others raised points dealing with immunity in canine distemper. There was difference of opinion as to the aetiology of canine hysteria and the mortality of the feline enzootics.—A. R. J.

HAUSER, H., & FRAUCHIGER, E. (1946.) Die pathologisch-histologischen Veränderungen im Zentralnervensystem bei der infektiösen Hühnerlähmung (Marek'sche Hühnerlähme). [The histopathological changes in the central nervous system in fowl paralysis.]—*Schweiz. Arch. Tierheilk.* 88. 212-218. 2517

The authors describe the microscopic pathology of 42 cases of fowl paralysis in which there was involvement of the central nervous system. The brain was affected in 80% and the spinal cord in 69%.

The lesions in the brain and cord took one of the following forms:—(1) a disseminated type which was the most common form, (2) a leptomeningitis and (3) lesions in and around the dorsal and ventral roots of the spinal nerves.

—A. R. JENNINGS.

KIUR-MUZATOV, A. P. (1944.) O chumye ptits. [Fowl plague.]—*Veterinariya, Moscow.* No. 11-12. pp. 28-31. 2518

Fowl plague was introduced into Russia during the German occupation but by the time of writing had been eradicated.

The disease is caused by an extremely virulent ultravirus, normally distributed in all tissues and secretions of the bird, although in some variations of the disease in other parts of the world it is more localized. It is always found in the brain tissues. Chicks from eggs of infected hens are also infected and usually die.

The virus is rendered harmless by direct sunlight in two days, by diffused sunlight in 15 days. Dried blood containing the virus remains infectious about three months, putrid carcasses three weeks and frozen carcasses more than 300 days. The virus is rapidly destroyed by heat, in 2-5 min. at 70°C. It is also said to be readily destroyed by disinfectants such as chloride of lime, creosote and mercuric chloride.

Mammals are not susceptible to fowl plague, whilst in natural conditions the only birds normally affected are hens, turkeys and guinea fowl. The author throws doubt on the opinion that young birds are not susceptible. There is no specific virus carrier, although blood-sucking insects may possibly transmit the disease mechanically.

The most characteristic symptom is sleepiness

due to infection of the brain. Other symptoms frequently observed include difficulties of breathing, discharge of viscous fluid from the beak, swelling of eyelids and diarrhoea (usually not bloodstained). The skin of the head becomes bluish, especially before death. There is loss of appetite, cessation of egg-laying and usually little movement although in some cases there is excitability and paralysis. The illness rarely lasts longer than seven days. A lightning form is sometimes observed which causes death in 1-3 hours. The mortality rate is 60-100%. The disease will spread through a flock in 5-8 days. The patho-histological picture is of encephalitic changes, interstitial myocarditis and fatty degeneration of the liver cells. In the brain are intercellular inclusions.

The best method of artificially infecting hens is by intramuscular injection. Doses as small as 0.000001 mg. of virus-containing tissue are sufficient. The small dose is characteristic of fowl plague and may be used as a diagnostic sign. Birds which do not die usually recover completely, but there sometimes remains paresis, lameness or paralysis of wings and legs. The author gives a résumé of the difference in characteristics of the forms of plague in various countries.

Quarantine of an infected farm is insufficient, a whole district must be quarantined, dead birds and eggs destroyed and vigorous disinfection measure undertaken. With such methods an outbreak in the U.S.A. was dealt with in six months.

The necessary practical tests have not yet been carried out on vaccines. The most promising vaccine is made from chick embryo and said to reduce mortality in a vaccinated flock to 2-3% as compared with 55-80% in an unvaccinated flock. [Many of the features described suggest that the disease may have been Newcastle disease.]—S. W. SALTER.

HUGHES, D. L. (1947.) **Ornithosis (psittacosis) in a pigeon flock.**—*J. comp. Path.* 57. 619-76. 2519

An account is given of an outbreak of ornithosis in a self-contained pigeon flock in Berkshire which had been established by purchasing birds from one dealer, who had imported the foundation stock from America. The virus was isolated by intracerebral inoculation of mice, which died in 4-7 days, but the particular strains in this flock failed to cause any obvious disease in mice when inoculated intraperitoneally. It was not possible to define any typical clinical symptoms in affected birds in the flock. Squabs (1-6 weeks old) and squeakers (6-16 weeks old) were usually thin, undersized and feeble; diarrhoea was common. Adults were usually found dead without preliminary symptoms.

At autopsy, two main types of disease process were observed. In the first, most commonly found in birds up to 16 weeks of age, there was an acute or subacute inflammation of the serous membranes, while in the older birds the liver and sometimes the spleen were enlarged. Small necrotic foci were seen in the livers of some and in a few there was a necrotic pancreatitis. Intracellular inclusion bodies were found in the parenchymatous cells at the edge of the necrotic foci in the liver and spleen in some birds, and as SMADEL *et al.* [see *V. B.* 15. 358] had found that the serum of one pigeon from the flock contained antibodies for the "I.N.I." virus, it was probable that at least some of the pigeons in the flock were infected with both the ornithosis virus and the "I.N.I." virus.

The distribution of the disease within the flock indicated that it primarily affected birds under 16 weeks of age and was probably maintained by latently infected adult carriers which had survived the disease when young.

An attempt was made to develop a vaccine to confer sufficient immunity to tide the young birds over the susceptible age period. A formalized vaccine was prepared from infected yolk sacs of chick embryos and used to inoculate pigeons at three weeks and again at six weeks of age, but this failed to protect the birds against natural infection.

No illness that could be attributed to the ornithosis virus occurred in the attendants working in the pigeon lofts, or in the two laboratory workers at risk; nevertheless, as ornithosis may be wide-spread in pigeons, the possibility of the disease must be borne in mind if any vague influenza-like illness develops in persons in contact with pigeons.—E. COTCHIN.

CASTEJON, R. (1944.) Las poliomieltis infecciosas en Patología comparada. [**Infectious poliomyelitis in comparative pathology.**]—*Zootecnia, Cordoba.* 5. 63-71. 2520

C. states that in Spain poliomyelitis is more frequent in rural districts than in towns and suggests that this may be because animals act as reservoirs of infection. He then attempts to support this suggestion by reviewing reported claims to have transmitted poliomyelitis infection to various animals and by comparing the features of some neurotropic infections of animals with poliomyelitis in man.—W. M. HENDERSON.

HUGHES, R. R. (1946.) **Post-penicillin jaundice.**—*Brit. med. J.* Nov. 9th. 685-688. 2521

A series of cases of jaundice with signs and symptoms indistinguishable from those of infective hepatitis was observed. Many of these had previously received penicillin injections and it is

considered that the condition was transmitted by means of contaminated syringes. It has been shown experimentally that a syringe may become contaminated during a single intramuscular injection of 1 ml. of fluid.—J. M. ROBSON.

COHEN, S. S., & ANDERSON, T. F. (1946.)

Chemical studies on host-virus interactions. I.

The effect of bacteriophage adsorption on the multiplication of its host, *Escherichia coli* B.

With an appendix giving some data on the composition of the bacteriophage, T.2. II.

The chemical simulation of the interference phenomenon by 5-methyl tryptophane.—*J. exp. Med.* 84. 511-523 & 525-533. 2522

I. The authors, accepting the conclusion that in a virus disease the host must provide the major part of the substance and energy essential for virus synthesis, have attempted a chemical study of a host-virus interaction. Owing to the difficulties of analysing the metabolic behaviour of animal tissues, the host-parasite relationship of bacteriophages T2 and T4 with *Bact. coli* B was selected. Respiration studies of the host infected with these two bacterial viruses in a synthetic ammonium lactate medium showed that, although the addition of the viruses stopped bacterial multiplication, the respiratory rate and the respiratory quotient of the inhibited bacteria remained for 1-9 hours at the level observed prior to infection. Multiplication of the bacteria could be inhibited by a bacterial lysate after removal of the bacteriophage and a similar inhibitor of multiplication was released from bacteria sonically vibrated in a modified Peirce magneto-striction oscillator. Centrifuged preparations of this inhibitor contained cytoplasmic granules possessing lactic acid dehydrogenase activity.

The chemical data supplied for bacteriophage T2 show it to have a high desoxyribose nucleic acid content (37% of purified, dialysed, dried preparations) and to be devoid of phosphorylated compounds such as ribose, nucleic acid and phospholipid.

II. Using the same bacteriophage—*Bact. coli* system as in I, an attempt was made to inhibit virus multiplication by chemical means in a manner approximating the conditions of the interference effect. 5-methyl-tryptophane did not reduce the titres of the bacterium or the bacteriophages when they were exposed separately to this agent but, in the presence of this compound, no virus multiplication was demonstrable in infected bacteria.—W. M. HENDERSON.

KOPROWSKI, H. (1946.) **Occurrence of non-specific virus-neutralizing properties in sera of some neotropic mammals.—*J. Immunol.* 54. 387-394. 2523**

Sera from certain species of marsupials and rodents captured in Brazil that gave positive results in neutralization tests with yellow fever virus usually also inactivated one or more of the following viruses, Japanese B, St. Louis and West Nile. These sera frequently inactivated as much as 100,000 LD50 of virus and the antiviral activity appeared to be due to the presence of some non-specific virus inactivating substance unrelated to previous infection.—W. M. HENDERSON.

DE RITIS, F. (1942.) **Basi sperimentali dell'immunologia e dell'immunizzazione nelle rickettsiosi. [Immunology and immunization of rickettsiae.]—*G. Batt. Immun.* 28. 365-384. 2524**

This is a short review of the literature on the preparation, use and effects of the various sera and vaccines for the several types of exanthematic typhus in man. No new knowledge is presented.

—I. W. JENNINGS.

GIROUD, P., & GIROUD, M.-L. (1944.) **Agglutination des rickettsies test de séro-protection et réaction d'hypersensibilité cutanée. [Agglutination of rickettsia. Serum protection test and test of skin hypersensitivity.]—*Bull. Soc. Path. exot.* 37. 84-93. 2525**

An attempt was made to compare the reliability of the agglutination, serum protection and skin hypersensitivity tests for typhus by carrying out a series of tests by all three methods on subjects with severe infection, or suppressed infection and on others protected by vaccination.

The aggln. test was carried out by using a suspension of rickettsia from the lungs of mice or rabbits. The suspension was added to dilutions of serum and a drop of the mixture placed on a slide, which was left 12 hours at laboratory temperature and then dried and stained and examined microscopically. To test the value of vaccination the test should be carried out both before and after vaccination, the highest agglutinin value being reached after two vaccinations at an interval of a week.

For the serum protection test, the serum to be tested was mixed with various dilutions of rickettsial suspensions and inoculated into the flank of rabbits. The hypersensitivity test was carried out by the intradermal injection of killed antigen.

In a severe infection all the tests gave strongly positive results, whilst in mild infections the hypersensitivity test gave more strongly positive results than the other two.

In vaccinated subjects the hypersensitivity test gave negative results unless a live vaccine had been used for immunization.—U. F. RICHARDSON.

GIRARD, H., & ROUSSELOT, R. (1945.) **La**

rickettsiose bovine à *Rickettsia bovis* au Soudan français. [*Rickettsia bovis* infection in cattle in French Sudan.]-*Bull. Soc. Path. exot.* 38. 64-77. 2526

A description is given of a disease of cattle, which is also said to infect sheep and which occurs in the French Sudan, and is called *nofel* by the local natives. The disease occurs principally in the winter (July-September), and assumes acute, peracute, subacute and chronic forms, with an infection rate in the herds under observation of 20-40% and a mortality rate of 17-21% of infected animals.

The first symptom is a drooping of one ear, the head being bent to that side and being frequently shaken as if to displace a foreign body. This symptom is ascribed to enlargement of the preparotid lymphatic node, the pressure of which is painful. There is loss of appetite and slight fever and later inco-ordination of movement, circling and finally decubitus. In some animals the limbs become rigid, the animal tending to circle. It may become furious and attack the herdsmen and finally falls.

The peracute form occurs in calves, which are found dead, the chronic form being symptomless, except for a febrile reaction, and a terminal enlargement of lymphatic nodes.

Lesions are inconspicuous comprising enlargement of lymphatic nodes and an increase of the cerebro-spinal fluid.

Examination of the blood reveals an intense monocytosis, parasites being usually absent, but sometimes detectable as free mulberry-like bodies. They occur in the cytoplasm of monocytes in smears from the lungs, kidneys, liver, lymphatic nodes and spleen.

In view of the resemblance of the condition to "turning sickness", its differentiation from theilerial infections and heartwater is discussed.

Treatment with sulphonamides, anti-

monials and tryparsamide was unsuccessful.

The pathogenicity of this organism in the Sudan compared with the symptomless infections described in Algeria may be ascribable to strain variations, or it may depend on the influence of intercurrent disease and malnutrition in Sudanese animals.—U. F. RICHARDSON.

POLLARD, M., DAVIS, D. E., & OLSON, T. A. (1946.) The serological detection of murine typhus in flea faeces.—*Amer. J. Hyg.* 44. 244-248. 2527

The authors describe a serological procedure for a quick determination of typhus infections in the faeces of rat fleas. The faeces are used as a complement-fixing antigen with known positive and known negative typhus antiserum. The technique detected the agent in the faeces of the flea and the specificity of the reaction was emphasized by the fact that there were no positive results from known negative preparations. Thirteen pools of flea faeces from 17 serum-positive experimentally infected rats had a positive complement fixation reaction and four were negative. Twenty pools from 22 serum-negative non-infected control rats were negative and two were anticomplementary. Thirty pools of flea-faeces were obtained from commensal rats which were positive for typhus. Of these pools, 14 had positive reactions, 11 were negative and five were anti-complementary. Fifty-three pools were examined from negative commensal rats and of these faeces pools two were positive and 51 were negative. The specificity of the reaction was checked with tick typhus, Q fever and with typhus serums. The technique is superior to others as results are available within two days after rats are caught. A few field trials indicated that the test can be employed in determining which of several localities have infective fleas and with the rapidity of the test control measures can be initiated with little delay.—C. HORTON SMITH.

See also absts. 2536 (c.f. tests in virus diseases); 2547 (Rous sarcoma); 2580 (foot and mouth disease); 2662-2675 (reports).

IMMUNITY

WITEBSKY, E., MOHN, J. F., HOWLES, D. J., & WARD, H. M. (1946.) A simple method for the concentration of Rh agglutinins.—*Proc. Soc. exp. Biol. N.Y.* 61. 1-5. 2528

The globulin precipitate obtained as a result of dialysis of a serum containing Rh antibody was dissolved in physiological saline using one-tenth the original volume of serum. This fraction contained the major portion of the Rh antibody and provided a potent Rh testing serum.—F. D. A. TYLER, A. (1945.) Conversion of agglutinins and precipitins into 'univalent' (non-agglu-

tinating or non-precipitating) antibodies by photodynamic irradiation of rabbit-antisera vs pneumococci, sheep-red-cells and sea-urchin sperm.—*J. Immunol.* 51. 157-172. 2529

Antisera against sea-urchin sperm, sheep erythrocytes and Types I and III pneumococci were made non-precipitating and non-agglutinating by photo-oxidation. One method consisted of irradiating the undiluted serum to which eosin Y as photosensitizing dye had been added; a second method measured the progress of irradiation by measuring the O₂ uptake of the dye-serum

mixture. These sera although no longer precipitating or agglutinating still combined specifically with the antigen and inhibited the reaction of the antigen with untreated antiserum. The length of time that a serum had been irradiated, *i.e.*, the degree of its photo-oxidation determined the degree to which it inhibited a reaction of the antigen with untreated antiserum.

The titre of an antibody against sheep erythrocytes decreased markedly as the process of photo-oxidation went on and so also did its haemolytic power in the presence of complement. The non-haemolytic sera finally obtained had a low capacity for inhibiting the haemolytic action of untreated antibodies.

From a pneumococcal antiserum made non-precipitating, precipitating antibodies could be obtained by fractional salting-out with ammonium sulphate.

T. discusses the theory of the conversion of antibodies into a "univalent" form with only one combining group available per molecule.

—A. MAYR-HARTING.

HOULIHAN, R., & COPLEY, A. L. (1946.) **The adhesion of rabbit platelets to bacteria.**—*J. Bact.* 52. 439-448. 2530

The mechanism responsible for the adhesion of bacteria to platelets was studied. It was found that the platelets of citrated rabbit blood when mixed with certain bacteria clumped together enmeshing the organisms. Platelets washed free of plasma and mixed with bacteria in the same way showed only rudiments of this effect. There was no correlation between the agglutinin titre of the rabbit serum for the organisms used and the degree of interaction between organisms and platelets.—A. MAYR-HARTING.

MCDIARMID, A. (1946.) **The transference of agglutinins for *Brucella Abortus* from cow to calf and their persistence in the calf's blood.**—*Vet. Rec.* 58. 146-149. 2531

Studies are presented on the development of agglutinins to *Br. abortus* in the calf as a result of the ingestion of colostrum. Data of the results for individual animals are given in tables; these confirm the findings of earlier workers on the subject. The author found no evidence that the presence of *Br. abortus* in milk or colostrum ingested by the calf prolonged the presence of antibodies in the calf's serum.—W. R. KERR.

GLYNN, J. H., & RICHARDSON, J. H. (1946.) **The antigenic properties of fibrin films and foams prepared from human and from bovine blood plasma.**—*J. Immunol.* 53. 143-150. 2532

Antibody production could not be demonstrated in rabbits implanted with fibrin films and foams, provided the films were autoclaved at

120°C. for 30 min., and the foam sterilized in dry heat at 170°C. for three hours. If, however, the heated materials were finely powdered, they were found to be feebly antigenic. It is suggested that this may be due to the small size of the particles permitting absorption into the circulation before digestion by tissue enzymes.—J. B. BROOKSBY.

HÖKL, J., & PROKUPK, K. (1946.) **Přítomnost hemolytického komplementu v seru některých domácích zvířat. [The presence of haemolytic complement in the serum of some domestic animals.]**—*Čas. československ. Vet.* 1. 74-75. 2533

The authors examined blood serum samples from 56 cattle, 24 goats, eight pigs and ten male g. pigs. Fresh serum of healthy animals was used. With undiluted bovine serum, complete haemolysis was never observed and partial haemolysis in only eight cases. With undiluted goat serum, complete haemolysis was obtained in all cases and with 50% serum, in two-thirds of the cases; goat serum diluted even more did not induce complete haemolysis. With pig serum diluted 1:7, there was complete haemolysis. Blood serum from g. pigs caused complete haemolysis when diluted 1:29 and in two cases even when diluted 1:157.—E. PŘIBYL.

NIGG, C., HILLEMANN, M. R., & BOWSER, B. M. (1946.) **Studies on lymphogranuloma venereum complement-fixing antigens. I. Enhancement by phenol or boiling.**—*J. Immunol.* 53. 259-275. 2534

In attempts to find a suitable preservative for lymphogranuloma venereum antigens for complement-fixation, phenol in 0.25% concentration was added to a 10% infected yolk sac suspension. It was found that the activity of such suspensions was greatly enhanced, especially at 37°C. Antigen titre in these experiments was defined as the highest dilution of antigen giving complete fixation. Enhancement of a suspension eight- or 16-fold can be brought about regularly by adding phenol to 0.5% and incubating at 37°C. for 20-30 days and then storing at 4°C. A similar enhancement was produced by boiling for 10 min., or by autoclaving at 15 lb. for 15 min. It is considered that autolysis is the main factor, since phenolized material stored at 4°C. without prior incubation at 37°C. had little or no enhancement. Advantages claimed for phenolized antigens in lymphogranuloma venereum include absence of anticomplementary activity and stability over periods of two years.—J. B. BROOKSBY.

*RAFFEL, S. (1946.) **A study of the relationship of resistance, allergy, antibody and tissue reactivity in tuberculosis to the components of the tubercle bacillus.**—*Calif. West. Med.*,

Tuberc. Suppl. 65. August. p. 13. [Abst. in *Amer. Rev. Tuberc.* 55. No. 3. p. 64. of absts., copied *verbatim*.] 2535

Acquisition of immunity in guinea pigs is found in response to attenuated living bacilli rather than to injections of the various component parts of the organisms: polysaccharide, phosphatide, wax, protein combined with phosphatide, unheated protein, bacilli from which lipids have been removed, defatted bacilli to which individual lipids have been readded or bacilli killed by moderate heat. Some heat-labile factor in the organism, a complex rather than one chemically distinctive substance, is apparently the immunogenic agent. No hypersensitivity develops in animals injected with large numbers of bacillary bodies from which the phosphatide and wax have been removed; sensitivity develops, however, when the wax is readded to the bacilli or when isolated protein and wax mixtures are employed for injection. An antiprotein immune body is responsible for serological reactions with the whole bacilli, although no correlation exists between the

occurrence of such antibody and the ability of the animal to resist infection. There is no detectable immunological factor in the blood of resistant animals, with respect to the major components of the bacillary cell. Similarly, skin reactions to protein may occur independently of acquired resistance. It is apparent from present information that the nature of resistance to tuberculosis remains enigmatic.

RICE, C. E. (1946.) Studies of the complement-fixing reaction in virus systems. I. Activities of vaccinia virus antigens and antisera.—*J. Immunol.* 53. 225-236. 2536

R. studied the relation between antigen, serum and complement in vaccinal systems, referring all titration results to the amount of complement necessary to give 50% haemolysis in the test. The complement-fixing capacities of two antigens may vary widely, although on the test of "dilution titre" as usually carried out, the two may be very similar. For the interesting mathematical treatment of the results, the reader should consult the original paper.—J. B. B.

See also absts. 2451, 2459 (c.f. test in TB.); 2453, 2454, 2456 (BCG vaccine); 2460-2462 (swine erysipelas); 2468 (plague); 2475 (anaphylaxis); 2485, 2486 (to trypanosomiasis); 2501 (interference phenomenon); 2505 (to neurotropic viruses); 2506 (rabies vaccines); 2514 (swine fever); 2523 (non-specific antibodies); 2524, 2525, 2527 (to rickettsia infections); 2550, 2551 (precipitins); 2564 (to avian lymphoid tumour); 2579 (relation to epidemiology); 2667-2675 (annual reports).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

I. MILNE, A. (1947.) The ecology of the sheep tick, *Ixodes ricinus* L. Some further aspects of activity, seasonal and diurnal.—*Parasitology*. 38. 27-33. 2537

II. MILNE, A. (1947.) The ecology of the sheep tick, *Ixodes ricinus* L. The infestations of hill sheep.—*Ibid.* 34-50. 2538

I. In view of the claim by farmers that ticks are absent from sheep in summer, but present on cattle, an attempt was made to observe the "host effect" by making weekly counts on sheep, rabbits, skylarks and meadow-pipits, on all of which the tick-activity curves were found to be similar in form and timing. It was noted, however, that the number of ticks taken from a hedgehog on June 15th was practically the same as the number taken from another hedgehog on September 11th. The factors which might influence a host effect are discussed, but it is suggested that the farmers' impression arises from the fact that ticks are more easily seen on cattle than on sheep. Further data show that where spring activity occurs the nymphal peak may be occasionally 2-3 weeks later than that for adults and not synchronous as stated in a previous article. Ticks are active at night but less so than in daylight. This diurnal fluctuation in activity seems to follow fairly closely the fluctuation in atmospheric temperature.

II. In general, female ticks have been found

to infest the hairy areas of sheep, *i.e.*, the head and legs; the comparatively bare areas (axillary and inguinal), and certain woolled areas, the short-woolled margins of the hairy and bare areas. Different tick stages attack in different zones of the same region.

On hill pasture where the main tick activity occurs in the spring only, the average total of female ticks carried by ewe, yearling and lamb were in the proportion 8:6:1, host size being thought to be the governing factor. On heavily infested hill pasture, stocked at one sheep to 1-5 acres, typical flocks feed from 100-600 female ticks per acre per annum.

The better the condition of a sheep, the less bare of wool and apparently the more greasy, the lower the tick infestation.

There is considerable range in weekly infestation, but individuals tend to keep their relative positions in this range. The rank of infestation in ten blackfaced sheep kept under observation showed a significant difference between the four or five less infested and the four or five more infested, but this difference could not be ascribed to variations in the pH and "yolk" content of the wool, or to the fleece greasiness. Lighter infestations were associated with coarser fleece hair and less fleece clearance from the ground, but the most important factor is con-

sidered to be individual activity, i.e., the more ground covered in unit time, the more ticks picked up.—U. F. RICHARDSON.

ADLER, S. (1946.) [Reflections on ticks.]—*Refuah vet. Palestine*. 3. 6-10. [Abst. from English summary.] 2539

A. gives a brief review of ticks as transmitters of disease to cattle and points out that there is no strict host parasite specificity in the transmission of rickettsia. Under laboratory conditions, a single rickettsia sp. transmitted under natural

conditions by *Dermacentor*, may without difficulty be transmitted by an *Ornithodoros* and so completely adapt itself that it can infect new generations.

A. emphasizes the importance in Palestine of the genus *Hyalomma*, pointing out the inadequacy of the present methods of specific diagnosis and classification. Dipping methods have failed to combat *Hyalomma* and much work will have to be done in the field and laboratory on the bionomics of ticks in the Middle East before results can be expected.

See also absts. 2467 (ticks and tularaemia); 2492 (ticks and equine piroplasmosis); 2493 (ticks and porcine piroplasmosis); 2623 (sheep scab); 2627 (D.D.T.); 2677 (tsetse flies).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

CARRICK, L. (1944.) The parathyroid glands in trichinosis.—*Amer. J. clin. Path.* 14. 24-27. 2540

In this study an attempt was made to find a relationship between infection in g. pigs with *Trichinella spiralis* and physio-pathologic changes in the parathyroid gland.

There were no significant variations in the serum calcium, inorganic phosphorus and phosphatase activity. Measurements of cross-sections of parathyroid glands from uninfected g. pigs gave a mean of 0.50 sq. mm. The sample comprised ten glands measuring 0.06-1.73 sq. mm. Measurements of cross-sections of parathyroid glands from infected g. pigs gave a mean of 0.75 sq. mm. The sample comprised six glands measuring 0.38-1.18 sq. mm.

C. concludes that there was moderate enlargement of the parathyroid glands of g. pigs whose skeletal muscles contained encysted *T. spiralis*.

—S. BRIAN KENDALL.

GOULD, S. E. (1943.) Pathology of trichinosis.—*Amer. J. clin. Path.* 13. 627-643. 2541

The gravid female *Trichinella spiralis*, deeply

embedded in the mucosa of the duodenum, jejunum and ileum, deposits larvae in the mucosa or in the central lacteal.

G. groups the lesions caused by the invasion of trichina larvae in man into six main groups:—intra-abdominal; skeletal muscle; cardiac; central nervous; pulmonary, and miscellaneous. The pathology of each group of lesions is discussed and illustrated by a series of photomicrographs.

—S. BRIAN KENDALL.

ALVAREZ, J. G. (1946.) The incidence of setariasis in Colombia.—*Vet. Med.* 41. 311-314. 2542

A. presents evidence which, he thinks, indicates that *Setaria* cause considerable stunting and loss of condition in both solipeds and cattle and death not infrequently in the young and occasionally in adult animals. Some statistics of the incidence of setariasis in Colombia are given and the value of the examination of fresh blood films by means of a portable microscope as a method of diagnosing the presence of these parasites is stressed. The paper contains five photographs, six sketches, a map of Colombia, and an autobiography of the author.—G. B. S. HEATH.

See also absts. 2628 (sheep parasites); 2629 (ascarids); 2630 (tapeworms).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

BAUMANN, R. (1944.) Das primäre Ovarialkarzinom des Rindes. [Primary ovarian carcinoma in cattle.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 1st. 280-282. 2543

B. gives an account of certain types of ovarian tumour: granulosa-cell and lutein-cell tumours, dysgerminomas and primary solid carcinomas. The first two types have been described in animals, but not, apparently, the third. B. now gives an illustrated description of the macroscopic and microscopic features of a primary solid carcinoma

of the ovary of a cow, which appeared to have originated from the germinal epithelium and had produced metastatic deposits on the visceral and parietal peritoneum and in the lungs.

—E. COTCHIN.

LÁSZLÓ, F. (1942.) Endotheliome in der Nebenniere. [Endothelioma in the adrenal glands.]—*Dtsch. tierärztl. Wschr.* 50. 505-508. 2544

Endothelioma in the adrenals of the ox are classified by L. as being either haemangio-endothelioma or lymphangio-endothelioma. The

possible origin of these neoplasms is discussed. Macroscopically they are said to be either very soft or firm, compact and, in some cases, chalky. Metastases are unusual. The histology is described.—A. R. JENNINGS.

EGEHØJ, J. (1942.) Lymphozytomatosis (Knuth & Volkmann) bei dänischen Rindern. [**Lymphadenosis in Danish cattle.**]—*Dtsch. tierärztl. Wschr.* 50. 462–466. 2545

E. concludes that lymphadenosis in Danish cattle is identical with lymphadenosis in German cattle. The characteristic change, the proliferation of primitive lymphoid tissue, is found throughout the reticulo-endothelial system. The disease is said to resemble a somewhat similar neoplastic disease of man.—A. R. JENNINGS.

CAMPBELL, J. G. (1946.) **Primary carcinoma of the liver in the duck.**—*Nature, Lond.* 158. 711–712. 2546

C. described two types of primary hepatic carcinoma met with in ducks. The affected livers were enlarged and contained multiple discrete green tumours. These tumours were shown to be either hepatocellular carcinoma or cholangiocellular carcinoma. C. suggests some infectious agent as a possible cause.—A. R. JENNINGS.

DURAN-REYNALS, F. (1946.) **The age factor in adaptability of a sarcoma virus to other animal species.**—*Science.* 103. 748–749. 2547

The author claimed that the age factor was of importance in the adaptability of the Rous sarcoma for other species. It was found that adaptation of the tumour agent from chicks to ducklings was most successful when the virus had been grown in fowls aged several months. The process was compared to bacterial variation in old cultures. Adaptation was very difficult and in some cases impossible when either very young or adult fowls were used.—A. R. JENNINGS.

MORRIS, H. P. (1945.) **Some nutritional factors influencing the origin and development of cancer.**—*J. nat. Cancer Inst.* 6. 1–17. [Author's conclusions copied *verbatim*.] 2548

Some of the more specific effects of nutrition on carcinogenesis are the following: riboflavin retards the early appearance of hepatic tumors following the feeding of *p*-dimethylaminoazobenzene but appears to increase the number of spontaneous breast tumors in mice. The primary effect of a cystine-deficient diet is to delay the appearance of hepatomas induced with *p*-dimethylaminoazobenzene, but it plays only a minor role in spontaneous-lung-tumor formation. Dietary fat increases spontaneous breast and epithelial tumors but inhibits induced sarcomas in mice. Restriction of the diet sufficient to produce chronic partial inanition causes loss of weight

in the adult and failure to grow in the young animal, fewer induced sarcomas and epithelial tumors and less spontaneous breast cancer in mice, and if continued for long periods and beginning at an early age, may completely inhibit mammary carcinogenesis in this species. It also prolongs the life of the experimental animal and modifies the endocrine secretions.

A study of nutritional regimens and particularly of those that affect mammary carcinogenesis in mice emphasizes the close similarity between the neoplastic process and the normal growth processes of the body. Many of the hormonal factors involved in the induction of mammary tumors in mice are also concerned with the normal growth and physiology of the mammary glands; and when the mammary glands fail to develop, there can be no mammary tumors. The nutrition of the host, therefore, is one important environmental factor which cannot be neglected in any study of experimental mammary carcinogenesis.

The effects of nutritional factors involved in the origin of experimental cancer are so variable that it seems impossible at the present time to form any general conclusions; but rather each specific tumor in several species must be studied individually under many different sets of dietary conditions before any broad generalizations can be made. Nevertheless, the effects of poor nutrition, and especially inadequate food intake on the whole organism are so far-reaching that to neglect to take the factors of nutrition into account may well mean the difference between success and failure in many studies of experimental carcinogenesis.

CARTER, C. E., & GREENSTEIN, J. P. (1946.) **Spectrophotometric determination of dehydropeptidase activity in normal and neoplastic tissues.**—*J. nat. Cancer Inst.* 7. 51–56. [Authors' summary copied *verbatim*.] 2549

The ultraviolet-absorption spectrum of the dehydropeptide, glycyldehydroalanine, and the spectrophotometric determination of dehydropeptidase I activity based on the disappearance of the high characteristic absorption of the compound at 2500 Å during enzymatic hydrolysis are described.

Purification of dehydropeptidase I activity of rabbit kidney was achieved by isolation of the pseudoglobulin fraction. Neutral solutions of salts were found to inhibit dehydropeptidase I activity, an effect proportional to concentration of salt.

Primary and transplanted mouse and rat tumors were found to possess uniformly high dehydropeptidase I activity.

Some theoretical aspects concerning the biologic origin of dehydropeptides are discussed.

MANN, L. S., & WELKER, W. H. (1943.) **Further studies of specific precipitin antisera for the protein of cancer tissue. I. II. The application of in vivo absorption.**—*Cancer Res.* **3.** 193-195 & 196-197. 2550

MANN, L. S., & WELKER, W. H. (1946.) **Further studies of specific precipitin antisera for the protein of cancer tissue. III. Relation of the proteins of different malignant tissues to each other.**—*Ibid.* **6.** 625-626. 2551

[Authors' summaries copied *verbatim*.]

I. Forty-two per cent (46 serums) of the serums of 109 rabbits injected with cancer tissue fixed on aluminium cream reacted with autolysates of cancer tissue with which they were prepared, but only 11 per cent (12 serums) were potent.

About half the animal serums were free of blood protein antibodies at the end of 6 months. The blood serum protein antibodies disappeared from the serums after from 2 to 18 months.

The precipitins for cancer tissue proteins persisted for a little more than 2 months after the serums were free of precipitins to blood serum proteins.

II. By the use of the absorption method *in vivo* we have been able to produce specific antisera for tissue proteins. However, the percentage of serums obtained by the application of this method is relatively low.

This technic is valuable in that the time required to obtain a specific antiserum for tissue protein is reduced from several months to a few weeks.

III. Antisera for carcinoma of the stomach, breast, kidney, rectum and metastatic carcinoma of the liver were titrated against autolysates of the breast, sarcoma of the breast, carcinomas of the cervix, carcinomas of the colon, carcinoma of the kidney, hypernephromas, metastatic carcinomas of the liver, carcinomas of the ovary, carcinomas of the stomach, carcinoma of the urinary bladder and carcinoma of the rectum. Some antisera showed interreaction with non-homologous autolysates whereas antiserum for carcinoma of the breast special was relatively specific, as it reacted only with its own autolysate and autolysates of carcinoma of the ovary. Some of the antisera reacted only with their homologous autolysates.

SHRIGLEY, E. W., GREENE, H. S. N., & DURAN-REYNALDS, F. (1947.) **Growth of avian tumors other than the Rous sarcoma in the anterior chamber of the guinea pig eye.**—*Cancer Res.* **7.** 15-20. 2552

This paper deals with the heterotransplantability of certain avian tumours. Filtrable and non-filtrable forms of these spontaneous and induced neoplasms were grown in the anterior

chamber of the g. pig eye.—A. R. JENNINGS.

WHITE, F. R., WHITE, J., & DAVID, P. W. (1946.) **Effect of cystine per se on the formation of hepatomas in rats following the ingestion of *p*-dimethylaminoazobenzene.**—*J. nat. Cancer Inst.* **7.** 99-101. [Authors' summary and conclusions copied *verbatim*.] 2553

The effect of cystine on the production of hepatic tumors in rats of the Osborne-Mendel strain by the oral administration of *p*-dimethylaminoazobenzene was determined by the paired feeding technique.

Cystine deprivation under these conditions probably exerts no effect on the total production of hepatomas resulting from the ingestion of the dye.

SHIMKIN, M. B., WYMAN, R. S., & ANDERVONT, H. B. (1946.) **Mammary tumors in mice following transplantation of mammary tissue.**—*J. nat. Cancer Inst.* **7.** 77-78. [Authors' summary copied *verbatim*.] 2554

Strain C3H male mice, free of the milk agent, were implanted in the midline of the abdomen with single ducts of breasts from normal C3H females 1.5 to 7.5 months old, and in the right axilla with 20-percent diethylstilbestrol-in-cholesterol pellets. Of 67 mice, 13 developed mammary tumors, but only 1 of the tumors appeared at the site of the mammary-tissue transplant.

HESTON, W. E., & DERINGER, M. K. (1947.) **Relationship between the lethal yellow (A^y) gene of the mouse and susceptibility to spontaneous pulmonary tumors.**—*J. nat. Cancer Inst.* **7.** 463-465. [Authors' summary copied *verbatim*.] 2555

The presence of the lethal yellow (A^y) gene increases the incidence of spontaneous pulmonary tumors in mice, as demonstrated by the higher incidence in the yellow (A^ya) F₁ hybrids from the cross between strain A and strain Y than in their brown (aa) litter mates. This effect is similar to that previously demonstrated for induced pulmonary tumors.

GREENSTEIN, J. P., CARTER, C. E., & LEUTHARDT, F. M. (1946.) **Activity of phosphatases in fresh and dialyzed extracts of normal mouse liver and of mouse hepatoma.**—*J. nat. Cancer Inst.* **7.** 47-49. [Authors' summary copied *verbatim*.] 2556

The relative susceptibility to the enzymatic splitting of inorganic phosphate from different kinds of substrates was studied under various conditions in fresh and in dialyzed extracts of normal mouse liver and of transplanted mouse hepatoma 587.

The activity of the phosphatase for phenylphosphate, β -glycerophosphate, pyrophosphate,

and for ribose nucleotides was nearly the same in fresh and in dialyzed extracts of either liver or hepatoma. In salt-treated, dialyzed extracts of liver the phosphate split from ribosenucleate and from desoxyribosenucleate was much higher than in fresh extracts of this tissue, whereas in salt-treated, dialyzed extracts of the hepatoma the amount of phosphate split was the same as in fresh extracts. Tentative explanations of these phenomena are discussed.

Pyrophosphatase activity in liver and in hepatoma is very high in presence of magnesium but not of calcium. The dephosphorylation of the nucleates is accelerated by calcium and magnesium. The phosphatases for the other substrates are little affected by the presence of these ions.

MAVER, M. E., DUNN, T. B., & GRECO, A. (1945.)
Catheptic activities of neoplasms and of the tissues of normal and tumor-bearing mice correlated with histologic changes.—*J. nat. Cancer Inst.* 6. 49–60. [Authors' summary copied *verbatim*.] 2557

The catheptic activities of the spontaneous neoplasms were higher than those of many transplanted induced neoplasms. No correlation was found between tumor size or growth rate and the catheptic activity. In all the neoplasms, the activity could be related to the amount of necrosis or connective tissue present. The highest catheptic activities of the tumors approached those of the spleen and lymphoid tissue.

The spontaneous and induced hepatomas both had higher catheptic activity than did the normal mouse liver, indicating that there was an increase in the catheptic activity when the normal cell became neoplastic.

Although the systemic effects of the neoplasms upon the host organs varied, often an increased catheptic activity, accompanied by leukocytic infiltration and extramedullary hematopoiesis, was found. These effects were especially pronounced in the mice of strains A and C3H bearing spontaneous mammary carcinomas and in strain C mice bearing the transplants of the Grady salivary carcinoma. The effect of the leukemias depended upon both the type of leukemic cells and the degree of infiltration of the tissues. The effects of the melanomas upon the liver and spleens were moderate increase in catheptic activity and not related to the size of the neoplasms.

LARSEN, C. D., RHOADS, P. B., Jr., & WEED, L. L. (1946.) **Survey of hypnotics in general with regard to pulmonary-tumor induction in mice.**—*J. nat. Cancer Inst.* 7. 5–8. [Authors' summary copied *verbatim*.] 2558

Administration of ethyl carbamate to strain A

mice elicited the formation of multiple pulmonary tumors in all animals. Pulmonary-tissue responses, as evidenced by the average number of tumors per mouse, were of the same order of magnitude, regardless of the mode of administration of a fixed total dose. The response noted following the use of tricapylin was comparable with that when water was the vehicle.

A series of barbituric acid derivatives, employed under conditions which, except for the limitations of dose tolerance, were analogous to those in urethane-treated mice failed to increase the incidence or frequency of lung tumors.

A miscellaneous series of compounds, urea, thiourea, ethanol, methylal, sulfonal, trional, chloral hydrate, and paraldehyde, some of which contain structural configurations found in urethane, and most of which are effective narcotizing agents in strain A mice, was tested. None of these compounds was capable of increasing the incidence or frequency of lung tumors.

Within the scope of the series of hypnotics examined, ethyl carbamate was found to be unique in its elicitation of pulmonary tumors in strain A mice.

SHIMKIN, M. B., & WYMAN, R. S. (1946.)
Mammary tumors in male mice implanted with estrogen-cholesterol pellets.—*J. nat. Cancer Inst.* 7. 71–75. [Authors' summary copied *verbatim*.] 2559

Male mice of strain C3H (Andervont subline) were implanted with single pellets of cholesterol weighing 2 mg. and containing from 0.5 to 50 percent of diethylstilbestrol, estradiol, or triphenylethylene; 149 mammary tumors were induced in 461 mice at average latent periods ranging from 5.9 months for the higher doses of estradiol to 16.8 months for the lower doses of diethylstilbestrol.

The average absorption of the pellets was 10 percent. The dose producing mammary tumors in 50 percent of the animals was calculated to be between 4 to 10 micrograms of estradiol and between 20 and 40 micrograms for diethylstilbestrol. Five percent of the animals developed mammary tumors with an absorbed dose of 2 micrograms of estradiol or diethylstilbestrol. No tumors were elicited with triphenylethylene.

The carcinogenic dose of estrogens for male mice of the C3H strain is well within the range of concentrations elaborated physiologically by normal female mice.

ESCHENBRENNER, A. B., & MILLER, E. (1946.)
Liver necrosis and the induction of carbon tetrachloride hepatomas in strain A mice.—*J. nat. Cancer Inst.* 6. 325–341. [Authors' summary copied *verbatim*.] 2560

Experiments are reported in which an attempt was made to determine the relationship between repeated liver necrosis and chronic regeneration and the induction of hepatomas in strain A mice with repeated oral administration of carbon tetrachloride.

A quantitative histologic study was also made of the course of necrosis and repair in the liver following a single necrotizing dose. The percent of liver necrosis in relation to dose was determined.

While it was found that a correlation exists between the degree of liver necrosis and the incidence of hepatomas in relation to dose, the use of a graded series of necrotizing and nonnecrotizing doses indicated that repeated liver necrosis and its associated chronic regenerative state are probably not necessary for the induction of tumors with carbon tetrachloride.

Under the same experimental conditions, the minimum necrotizing and tumor-inducing doses for carbon tetrachloride were less than those for chloroform while the relative anesthetic activity of these two chemicals was of the reverse order.

During the course of chronic administration of carbon tetrachloride, the livers developed either relative or complete resistance or insensitivity (depending on the dose) to the necrotizing action of the agent; the hepatomas were completely insensitive or resistant. Following a single dose, the liver necrosis was uniformly centro-lobular. After chronic administration of the agent, the liver necrosis was around central veins, mid-zonal, or adjacent to portal veins and bile ducts.

There was a correlation between the dose of carbon tetrachloride chronically administered and the degree of lobular disorganization and amount of reticulum fibers deposited in the liver. Slight increase of reticulum fibers was observed after the chronic daily administration of sub-necrotizing doses of the agent.

DUNN, T. B., & KESSEL, A. M. (1945.) **Paneth cells in carcinomas of the small intestine in a mouse and in a rat.**—*J. nat. Cancer Inst.* 6. 113-118. [Authors' summary copied *verbatim*.] 2561

The morphology and staining reactions of Paneth cells in two carcinomas of the small intestine, one in a mouse and one in a rat, are described. The cells constituted an actual part of the neoplasms and showed developmental stages not often identified in normal tissues.

A number of staining reactions of Paneth cell granules in the normal mouse intestine were investigated. The granules were selectively stained by Popoff's method III, by De Galantha stains, and by the Bowie pepsinogen stain. Mayer's mucicarmine stain left the granules

uncolored while the surrounding cytoplasm was faintly pink. The pepsinogen stain was the only one which also gave a selective staining to granules in the acinar cells of the pancreas.

BRYAN, W. R., RILEY, V. T., DEIHL, D. G., & VOORHEES, V. (1947.) **Studies on the agent chicken tumor I. I. The relative potencies of serial extracts and their comparative values as source materials for purification studies.**—*J. nat. Cancer Inst.* 7. 447-453. [Authors' summary copied *verbatim*.] 2562

The relative potencies and total nitrogen contents of serial extracts of fresh chicken-tumor-I tissue, prepared with 0.9 percent NaCl solution, were studied in experiments carried out with quantitative biological techniques. The results showed that second extracts contained considerably less mucoid and nonactive nitrogenous material than first extracts and were sufficiently potent to serve as practical sources of tumor agent for experimental purposes.

Serial extracts subsequent to the second were considerably weaker in tumor-producing potency and offered no advantage, with respect to purity, over second extracts.

It is suggested that second extracts may constitute a more desirable starting material for studies on purification of the active agent than first extracts which have been generally employed.

BRYAN, W. R. (1946.) **Quantitative studies on the latent period of tumors induced with subcutaneous injections of the agent of chicken tumor I. I. Curve relating dosage of agent and chicken response. II. Estimation of the latent period.**—*J. nat. Cancer Inst.* 6. 225-237 & 373-377. [Author's summaries copied *verbatim*.] 2563

I. The latent-period response of chickens to subcutaneous injections of the agent of chicken tumor I was investigated in 13 experiments. With the exception of an occasional discordant chicken group (2 in 68), the mean reciprocal of the latent period was found to follow a linear relationship with the logarithm of dose. This function serves as a satisfactory criterion of biological activity for statistically controlled, quantitative studies on the tumor agent by simplified procedures. Evidence of heterogeneity among chicken responses was obtained and must be taken into consideration in the planning of experiments and in the interpretation of results.

II. A method is presented for the quantitative estimation of latent periods of tumors induced with the agent of chicken tumor I. Technical and biological limitations, as well as theoretically desirable procedures, were taken into consideration in planning a suggested schedule of routine

periodic examinations for determining the time of appearance of tumours. An alignment chart is given which facilitates the determination of latent periods and their reciprocals (which are used for the purpose of statistical analysis).

BURMESTER, B. R., & BELDING, T. C. (1947.)
Immunity and cross immunity reactions obtained with several avian lymphoid tumor strains.
—*Amer. J. vet. Res.* 8. 128-133. 2564

Chickens inoculated with tissue from lymphomatous tumours were rendered immune against another inoculum of the same tumour 1-2 months later. Frozen and thawed cell-suspensions and cell-free extracts, although not regularly producing a palpable tumour, rendered a proportion of the animals immune. Cross-immunity between some of the five tumour strains tested was found, but to reveal it the strains had to be tested in both of the two possible sequences of inoculation. This immunity was specific, injections of normal tissues

See also *abst.* 2634 (sarcoma).

failing completely to induce any immunity against the tumours.—A. MAYR-HARTING.

RILEY, V. T., CALNAN, D., & BRYAN, W. R. (1946.) **Studies on the influence of age on the latent-period response of chickens to the agent of chicken tumor I.**—*J. nat. Cancer Inst.* 7. 93-98. [Authors' summary copied *verbatim*.] 2565

In two experiments carried out with quantitative biological techniques, studies were made of the latent-period response of chickens of different ages to the agent of chicken tumor I. No significant difference was found between the response of 3-week and 10-week-old chickens. Four-day-old chicks, however, developed tumors at a significantly slower rate and in fewer instances (at low dose levels) than did the 4-week-old chickens with which they were compared.

A possible interpretation of the latter finding is discussed.

DISEASES [NON-INFECTIVE] OF BREEDING STOCK

HART, G. H., MEAD, S. W., & REGAN, W. M. (1946.) **Stimulating the sex drive of bovine males in artificial insemination.** [Correspondence.]—*Endocrinology.* 39. 221-223. 2566

Of 14 bulls used in one year at an artificial insemination centre only eight were satisfactory for sex drive whilst three showed periodic impotency and a further three were eliminated for impotency. For service, one non-resisting, anoestrous cow was used regularly.

This report deals with the three bulls with impotent periods. Semen, when obtained, was very poor. Equine gonadotropin and testosterone propionate [dosage not given] had no effect. Service to a normal cow, in oestrus, restored sexual vigour completely and immediately, but return to teaser service caused impotence in 14 days.

Smearing the external genitalia of a teaser cow with vaginal mucus from an oestrous cow only slightly increased sexual libido, but with a normal cow in oestrus, the same bulls each gave several services, at intervals of a few minutes, yielding first quality semen. Smearing the genitalia of a teaser with mixture of urine and mucus from an oestrous cow provoked performances only slightly less vigorous than when during natural service a few days previously. In both cases the bulls were stimulated by the proximity of the cows, and on one occasion service to a teaser was obtained when an oestrous cow had been nearby.

The authors conclude that in bovines it is

female odour and not behaviour which stimulates male libido. The problem is discussed in relation to artificial insemination organization.—R. J. F.

MØLLER-SØRENSEN, A. (1940.) Meddelelser fra kirurgisk Klinik. Om Bedækningsudygtighed (Impotentia coeundi) hos Tyre forårsaget af kirurgiske Penis- og Praeputiallidelser. [Communications from surgical practice. Penial and preputial disease causing impotence in bulls.]—*Maanedsskr. Dyr læger.* 52. 1-20. 2567

Wounds and contusions of the penis and prepuce are often seen in young bulls. The prognosis is generally favourable in the case of wounds, but dubious in the case of fractures with hematoma. Prolapse of the penis combined with paraphimosis is sometimes met with. In many cases of contusion, tumours, etc., the prognosis is good, but in cases caused by paralysis of the posterior haemorrhoidal nerve, prognosis is unfavourable. Phimosis is comparatively common: it is very occasionally of hereditary origin but is usually acquired, in which case good results often follow surgical treatment. Balanitis causing adhesions may respond to surgical treatment. 60% recover.

Such tumours as fibroma and papilloma are most common. Extirpation gives good results in many cases, but in a number of cases the tumours are apt to recur and the operation must be repeated.

—H. C. BENDIXEN.

SCHUMANN. (1944.) Veterinärmedizinische Abteilung der Schlesischen Gesellschaft für vater-

ländische Kultur in Breslau. "Die Sterilität der Stuten." [Meeting of the veterinary medical section of the Silesian Society for German Culture in Breslau. Sterility in mares.] —*Tierärztl. Z.* No. 1. p. 16. 2568

S. considers that 25% of cases of infertility in the mare are due to incorrect timing of service in relation to ovulation. Uterine infusion with normal saline is recommended for cases of endometritis. Infertility in stallions is often associated with over-work.—A. T. COWIE.

ZAVADOVSKIĬ, M. M. (1941.) Gormonal'nyi metod stimulyatsii mnogoploদিয়া ovets. [Hormonal stimulation of multifoetation in sheep.] pp. 204. Moscow: Ogiz, Sel'khozgiz. [Abst. from translation.] 2569

There is a natural limit to which the productivity of sheep can be improved by efficient methods of management, care and feeding alone. To increase the number of lambs above this limit, hormonal methods of stimulating either multifoetation or more frequent breeding are necessary. In this book, Z. reports the results of large-scale experiments involving the injection of many thousands of sheep with pregnant mare's serum to induce multifoetation.

Increasing doses of P.M.S. from 600 to 1,400 mouse units resulted in an increasing production of ova up to a maximum of twice the control level with a dose of 1,400 M.U. In sheep, whose average cycle length was $16\frac{1}{2}$ days the 13th day of the cycle was found to be the most suitable one on which to inject, since injections on that day caused the liberation of a larger number of eggs than on any other day of the cycle. The most economical method of treating a large flock was to group sheep which were at the 12th, 13th and 14th day of the cycle and to give each a single injection of 1,200 M.U. of P.M.S.; thus the entire flock could be treated as six groups. Artificial insemination was found to be neither necessary nor advantageous. The hormone treatment was more successful in the first half of the breeding season than in the second half.

Although the birth weight of lambs decreased with increasing number of foetuses and the lamb mortality was highest when the number of young was large, the ratio of surviving lambs in an experimental flock at weaning to those of control untreated sheep was 146:106. After weaning, the lambs from treated sheep grew at least as well as those from control ewes.

As a result of the investigation of subsequent breeding cycles of some 320,000 ewes after P.M.S. injection, Z. concludes that no deleterious effect is produced by injections of P.M.S. when these are given in the follicular phase of the cycle. P.U. tended to produce giant follicles which failed to

rupture, but this was never observed after injections of P.M.S.—A. L. GREENBAUM.

LESBOUYRIES, G. (1944.) Nymphomanie et virilisme. [Nymphomania and masculinity in female domestic animals.]—*Bull. Acad. vét. Fr.* 17. 324-331. 2570

L. deals chiefly with the cow and attempts to draw a sharp line between nymphomania, characterized by intensified and prolonged heats, with the retention of female secondary sexual characteristics, and virilism, in which he considers that the diminution or disappearance of heat periods accompanies the development of some degree of sexual inversion. Only the former is usually associated with the presence of ovarian cysts.

Urine oestrogen estimations were made on cows in various sexual states, confirming that there was only a slight excretion towards the end of pregnancy in this species and showing that at the time of normal heat no excretion could be detected. Three samples of cystic (follicular) fluid had a moderate oestrogen content and in these cows urine oestrogen level approached that of late pregnancy. But in a cow with symptoms of virilism, no urine oestrogen could be detected.

Evidence is quoted in support of the view that many cases of nymphomania are due to external causes, such as hereditary predisposition, nervous conditioning and irritation of the clitoris, e.g., by a retained cereal awn. This is thought to account for those cases, commonly encountered, in which there is no improvement following oophorectomy: L. often found a simple clitoridectomy a complete cure.

Virilism in the cow is considered to bear some relation to the condition in the woman, L. believing that there is, in both cases, secretion of androgens by the ovary; in the cow, however, it occurs as the result of a functional variation only, following on from endocrine overstrain due to forcing for milk production. It is admitted that androgen production in the typically "virile" cow [the description tallies with the end result of a bad case of "cystic disease" as observed in U.K.] has not been actually demonstrated; L. suggests it as a subject for further research.—F. L. M. D.

DE GROOT, T. (1942.) The heredity of smooth tongue, with special reference to cattle.—*Genetica.* 23. 221-246. [In English.] 2571

A defect in cattle known as smooth tongue (epitheliogenesis imperfecta linguae bovis) has become widespread, especially in certain strains of cattle, in Holland during the past ten years. The syndrome has many points of similarity with a condition in man known as hereditary hypochromic anaemia.

The most striking feature in cattle is the

smoothness of the tongue. The papillae filiformes, although of normal length, are very thin, especially on the dorsum of the tongue. The mucous membrane is thickened with defective cornification. Persistent salivation, eczema, alopecia, folding of the skin and a velvety appearance of the coat are present. The head is often narrow, the horns softer than normal and slight diarrhoea is often present. The condition occurs in cattle of all ages and both sexes. The red blood cell count is within normal limits but the average diameter is abnormally high. The Fe content of the serum is always very low and treatment with Fe has a favourable effect on some of the symptoms.

The heredity of the condition was studied in some 350 affected cattle whose pedigrees were registered in the herd book. It was found that all the pedigrees traced back about ten generations previously to one bull. In almost all pedigrees his son also appeared. As a result of his study S. concludes, citing evidence to support his conclusion, that the condition is due to a simple recessive gene.—M. C.

WEBER, W. (1946.) Über Art, Häufigkeit und Genfrequenz der Missbildungen unserer Haustiere, nebst einem Fall von Agenesie des Geruchsapparates bei einem Kalb. [Variety, importance and genetic frequency of malformations in domestic animals, with a case of agenesis of the olfactory structures in a calf.] —*Schweiz. Arch. Tierheilk.* 88. 497–507. 2572

During the last 30 years in the Canton of Berne between 580 and 1,160 cases of developmental abnormality occurred. No accurate figures for the total births during this period are available, but estimates are in the region of 150,000 calves born per year. These figures, used in a formula quoted, give a genetical frequency of developmental abnormality in calves as between 1.2% and 1.6%.

A number of cases of developmental abnormality in the horse, ox, sheep, goat, dog, cat and fowl are classified into 31 groups. Hydrocephalus, supernumerary digits and schistosoma reflexum are of most common occurrence.

A case of lack of development of the olfactory apparatus in a calf is fully described. The olfactory bulb failed to develop and there was a corresponding defection of associated structures.

—R. SCARISBRICK.

HOGREVE, F. (1943.) Zwillings- und Drillingsuntersuchungen beim Rind unter besonderer Berücksichtigung der Skelettvariabilität. [Incidence, of twins and triplets in cattle and skeletal variability.] —*Züchtungskunde*. 18. 81–88. 2573

This is a detailed abstract of and commentary upon an inaugural dissertation by M. BELIC of Nisch.

Biological aspects of twins and triplets in cattle are reviewed and some new information considered. From extensive material of European origin it has been estimated that 1.3% of all bovines born are twins and that 5% of all twins are monovular. Multiple births are to some extent an inherited character; thus cows have been known to produce 25 calves at seven parturitions, 15 calves at five parturitions and so on, and bulls have been known which produce daughters which tend to have multiple births. The higher mortality of twin and triplet calves tend to offset the higher birth rate they might give rise to in a herd and the tendency to sterility in twins is a further disadvantage. A multiplet pregnancy predisposes to genital disease and fertility after a twin birth is often impaired temporarily or permanently. The extent to which multiplets become breeding animals is not great: thus in one German herd only 3.7 of all multiplets born achieved subsequent entry into the herd book, but in other herds 27 and 25% did so.

BELIC evidently broke new ground in investigating skeletal variations in twin and triplet cattle. H. examined in detail three pairs of twins and one set of triplets, two twin pairs being full grown, the other nearly full grown and the triplets only three months old. The twins were all pied lowland cattle and the triplets Württemberg spotted cattle.

The extent of variation in bone size between the respective twins or triplets is expressed in percentage. Differences were low (1–3%), the greatest difference being between the vertebrae, less between the pelvis, still less between the fore limb and least between the hind limbs. In one of the twin sets, the manubrium of the sternum of one twin was normal and shortened by fusion of the fifth and sixth segments in the other.

Variations between the triplets did not exceed 2.6%.

H. considers that these researches may lead to notable advances in the science of genetics.

—J. E.

KEMP, T. (1944.) Mutation as a cause of disease. —*Acta path. microbiol. scand.* Suppl. No. 54. pp. 195–208. [In English. Author's summary slightly amended.] 2574

Mention is made of several hereditary diseases which may reasonably be assumed to arise relatively often through mutation.

A review is given of dominant, recessive and sex-linked affections for which the mutation rate has been calculated. These rates were found to fall between $1:10^{-4}$ and $1:10^{-5}$.

For determination of the mutation rate in the various hereditary diseases a eugenic registration

See also absts. 2444 (infertility); 2600 (sterility and nutrition).

DISEASES, GENERAL

I. JANSEN, J. (1942.) Overzicht der onderzoeken van het uit de praktijk ingezonden ziektemateriaal over 1941. [Report for 1941 on the investigation of material sent in by practitioners to the Institute for parasitical and infectious diseases of the University of Utrecht.] —*Tijdschr. Diergeneesk.* 69. 414–419. [English, French and German summaries.] 2575

II. JANSEN, J., & VAN DEN HURK, F. G. W. (1945.) Overzicht der onderzoeken van het uit de praktijk ingezonden ziektemateriaal over 1942. [Pathological findings during 1942.] —*Ibid.* 70. 107–114. [English summary.] 2576

III. JANSEN, J., & VAN DEN HURK, F. G. W. (1945.) Overzicht der onderzoeken van het uit de praktijk ingezonden ziektemateriaal over 1943. [Pathological findings in 1943.] —*Ibid.* 70. 202–208. [English summary.] 2577

IV. JANSEN, J., & VAN DEN HURK, F. G. W. (1945.) Overzicht der onderzoeken van het uit de praktijk ingezonden ziektemateriaal in 1944. [Results of P.M. examinations in 1944.] —*Ibid.* 70. 303–306. [English summary.] 2578

I. In 1941 the number of examinations made was 1911. The most important findings were *Bact. flexneri* infections in apes (*Macacus mulattus*, *Macacus cynomolgus*, *Simia satyrus*). In g. pigs ammonium-weak, rhamnose-negative *S. typhi-murium* (duck type) was found. Coccidiosis due to *Eimeria truncata* of the kidney was determined in a goose. From the urine and phlegmonously inflamed bladder wall of a dog, *Cl. welchii* was isolated directly in pure culture. Two cases of death caused by *Past. pseudotuberculosis* were observed in turkeys. Pox virus (sparrow type) was determined in a jackdaw (*Colaeus monedula*).

In rabbits, death was caused by a very pathogenic virus. From a mouse ammonium-weak *S. typhi-murium* (pigeon type) was isolated; two *Salmonella* cultures which were isolated from mice and submitted for examination proved to be *S. enteritidis* var. *danzysz*. *Str. pyogenes* ("animal type") was isolated from the milk of a mare with mastitis. From a pig assumed to have died of an anaerobic infection, *Cl. septicum* was isolated.

II. In 1942, 2,180 examinations were made. The most important findings were: *Bact. flexneri* in a monkey; coccidiosis of the kidneys in geese; listeriosis [*Erysipelothrix*] in a goat and in rabbits (these *Erysipelothrix* strains were very pathogenic for canaries); arthritis caused by *Bact. equirulis* in two rabbits (this strain was pathogenic for

of the population will be required; and this measure ought to be adopted by all countries.

canaries); pneumonia in mice caused by *Corynebact. kutscheri*; *Bact. equirulis* infections in young foals and of the spermatic cord stump of a ten-year-old gelding; cases of mastitis and endometritis in mares all caused by *Str. pyogenes* (animal type); an anaerobic infection in sheep, resembling braxy, in which gas phlegmons were noted in the muscles; *S. dublin* infection in silver foxes and in a horse; and *S. typhi-murium* (duck type) infection in a horse, a cat, a piglet and a ferret.

III. In 1943 the number of examinations made was 1,399. The most important findings were a case of human type TB. in a monkey, in which the heart had been particularly affected; high mortality due to trichomoniasis in wild pigeons; many cases of TB. in ducks, frequently in the air-sacs; in a few cases coccidiosis due to *Eimeria truncata* in geese; pseudotuberculosis in turkeys and canaries; and listeriosis [*Erysipelothrix* infection] in rabbits. From the pus of a mare with endometritis and the milk of a mare with mastitis, *Str. pyogenes* (animal type) was isolated; from the organs of a cow which had died of an acute enteritis a non-haemolytic streptococcus was isolated, which was pathogenic for mice.

IV. In 1944, 867 examinations were made. The most important findings were: TB. (very prevalent) and salmonellosis in ducks; coccidiosis due to *Eimeria truncata* in geese; enteritis in goats; pasteurellosis in a hare; pseudotuberculosis in canaries; coryza, neurolymphomatosis, leucaemia, TB., pullorum disease, coccidiosis and many cases of worm infections, especially due to *Capillaria*, in fowls; rhinitis, necrobacillosis and infection caused by *Treponema cuniculi* in rabbits; *C. kutscheri* infections, paratyphus and a case of nephritis caused by *Staphylococcus albus* in mice; some cases of orchitis caused by *S. abortus equi* in horses and *Bact. equirulis* infections in foals; infection by the rhamnose-negative type of *S. typhi-murium* in a parrot; TB. in a wild rook (*Corvus frugilegus* L.); a number of cases of swine plague and infections with *Streptococcus pyogenes* (animal type).—R. PETER JONES.

PETERSEN, H. (1946.) On the distribution of the morbidity of epidemic diseases with regard to age.—*Acta. med. scand. Suppl.* No. 179. pp. 61. [Author's summary slightly amended.] 2579

The two facts that newborn children possess a high degree of immunity from infectious diseases (inborn immunity) and that infectious diseases

often leave immunity (acquired immunity) must involve that the rates of morbidity becomes low in the very tender ages, when most individuals still possess inborn immunity, and in the very high ages, where the majority has acquired immunity. Consequently there must be an intermediate range of age with a maximum rate of morbidity, and, conversely, it can be said that the fact that morbidity generally displays a characteristic age distribution, often with a marked maximum in a definite age (children's diseases) may be interpreted as a result of the two aforementioned circumstances.

The resultant age distribution may on the basis of certain highly summarized presumptions with regard to the law governing the vanishing of inborn immunity with age be computed as being dependent on this law and on the frequency of infection.

Many different consequences have been derived from the theoretical expression found as to how the character of infectious diseases, as far as regards the age distribution of morbidity, must be dependent on and variable with the frequency of infection (hygienic conditions), the density of population, and the time for the vanishing of inborn immunity.

Comparisons are made between the theoretical results and the distribution of age for a number of different diseases, and it is established that the difference between the rates of morbidity in the towns and in the country, ascertained during the great poliomyelitis epidemics in Sweden 1911-18, agreed fairly well with what was to be expected according to theory.

The law applied for the vanishing of inborn immunity is not based on any special assumptions; it is only supposed that for every time unit the same fraction of existing immune individuals will lose immunity, which involves that the present number of individuals with inborn immunity will decrease according to an exponential law. This agrees only very roughly with the—remarkably few—observations available, which show a decrease which, immediately after birth, is slower than what corresponds to an exponential law, whereas the agreement is increasing when a longer time has elapsed after birth.

As the inborn immunity from most diseases vanishes very quickly—in the course of the first year of life—the said discrepancy in the very tender age does not, upon the whole, affect the distribution of the morbidity with regard to age. But in respect of diseases where the inborn immunity is lost comparatively late—in the course of some years—it is to be expected that there will be a discrepancy between the theoretically computed and the actual course of the variation of

morbidity with age, particularly in the young years. This exactly appears to be the case with phthisis. It has therefore been attempted to adopt a new explanation with regard to the loss of inborn immunity, namely, that the duration of the latter should be looked upon as a *property*, characteristic of all individuals but of different extent in the separate individuals, so that the individual values of duration are distributed round the average duration for all individuals according to the Gaussian law of distribution. It appears from a comparison with the only observations, which the author has been able to find, that the latter agree exceedingly well with the assumption made. According hereto it should be possible to describe the phenomenon, inborn immunity, in its variation with time by an *average* duration, which is the one most frequently occurring, and by a *dispersion*, which gives the frequency of the occurrence of deviating values of duration. The average duration and the dispersion of the inborn immunity from TB. are then determined, and, on the basis hereof, a new curve is computed for the variation of the morbidity with age; this curve does, also in respect of the low age group, agree with the actual one.

The theory laid down permits a computation of how the number of individuals, who *have had* the disease, varies with age. Generally, no records thereof are available for the majority of diseases; but they do exist in our day in respect of TB. in that the individuals who give positive tuberculin reactions* may be supposed to be identical with the individuals who have contracted tuberculosis. A comparison between the actual figures and theory seems to show good agreement provided that no foreign sources of infection be present.

Finally, the theory laid down permits, on the basis of the actual curve for the distribution of morbidity with age, a computation of the extent of a possibly existing "latent infection", i.e. an infection which leaves immunity without the process of immunization having manifested itself in the characteristics of a disease.

KAPLAN, M. M. (1946.) **UNRRA responsibilities in Greece concerning the control of piroplassmosis, foot-and-mouth disease, and some exotic diseases.**—*Vet. Rec.* 58. 607-610. 2580

Greece provides one of the most vulnerable gateways for the entrance of epizootics to the European continent and UNRRA was aware of this when it undertook the task of livestock rehabilitation in April, 1945. The diseases most feared were rinderpest, piroplassmosis and foot and mouth disease. The chief danger of introducing rinderpest was through the introduction of cheap cattle from Ethiopia and Egypt: arrangements were made to store 100,000 doses of the chick

embryo vaccine for use against the disease.

As regards piroplasmosis, which is enzootic in Greece, the difficulty in arriving at a rapid diagnosis owing to the scarcity of veterinary surgeons and other causes are discussed. The use of D.D.T. to eliminate ticks is described; the best means of reducing losses in the circumstances was, however, found to be 5% perivan, an ampoule containing 6 ml. being given to each recipient of an UNRRA-imported animal, along with instructions on its use.

The difficulties of controlling foot and mouth disease are discussed: the use of the Waldmann foot and mouth disease vaccine was considered, but from the economical standpoint, and other causes was not practical. Difficulty was experienced in typing the strain of virus present and in Thrace, animals were reported as being re-infected after an interval of only three months. Another source of infection was the frozen meat from the Argentine used for the British troops, but precautions as to the use of swill were taken and, fortunately, but few pigs were bred by the Greeks in the neighbourhood. The general condition of the country and the lack of control all mitigated against successful methods of disease prevention.

—D. S. RABAGLIATI.

I. ANON. (1942.) Tierseuchen im Auslande. [Animal diseases in European countries other than Germany.]—*Reichsgesundheitsblatt*. 17. 280, 412, 540, 688, 812, 932. 2581

II. ANON. (1943.) Tierseuchen im Auslande. [Animal diseases in Europe (excluding Germany).]—*Ibid.* 18. 176, 288, 452, 584, & 716. 2582

I & II. These reports consist solely of tables showing the numbers of cases of 13 specific diseases which occurred during fortnightly periods in most of the countries of Europe. There are also footnotes on the incidence of some additional diseases. The tables contain many blank sections denoting "no information", so that they do not give a uniformly even idea of the disease situation over the whole of Europe at any time. It is necessary to refer to the tables for the detailed statistical data.—J. E.

GRIBANOV, V. N. (1937.) Epizootologicheskie faktory pri massovykh zabollevaniyakh telyat v Bashkirskoi ASSR. [Analysis of epizootological factors in mass infections of calves in the Bashkir Republic, U.S.S.R.]—*Trud. vsesoyuz. eksp. Inst. Vet.* 14. 160–168. [French summary.] 2583

G. made an extensive examination of the various factors which contribute to infection of calves in the Bashkir Republic. The main predisposing factor to infection and its spread is the

lack of hygiene and sanitation on the various farms. Dirty, inadequate buildings, insufficient cleanliness of udders and buckets; feeding calves from the same bucket in turn; cold, damp pens in the winter and lack of regular disinfection were encountered.

Of 183 infected calves examined bacteriologically, the main diseases found were *S. paratyphi* infection (27.3%), *Bact. coli* infection (25.7%), enzootic pneumonia (20.7%) and septicæmic diseases (0.5%). 17.5% of the diseases were not identified.

Mortality (41.9%) occurred mainly 1–14 days from birth. This was particularly marked where hygiene and sanitation were greatly at fault. The biggest mortality occurred from 2–5 months of age, when the climatic conditions had a considerable bearing.

G. concludes by stressing the importance of spreading calvings over a longer period of time, avoiding congestion and using the best months of the year for calf rearing.

The feeding of cows should also be supervised. It was found that by excluding malt (in the form of a by-product from wine-making) two months before and after calving, the calves were less susceptible to disease.—OLGA UVAROV.

— (1946.) Epidemic diseases of cats. Discussion by the Central Veterinary Society. [Speakers:—HOLLIDAY-POTT, F. C., & UVAROV, O.]—*Vet. Rec.* 58. 497–501. 2584

This was a very general discussion on the epidemic diseases of the cat. The clinical features were dealt with at length. There was some difference of terminology but no new knowledge

—A. R. JENNINGS.

HOLMAN, H. H., GORDON, W. S., & PATTISON, I. H. (1944.) Observations on the pathology and histology of grass sickness in horses.—*J. comp. Path.* 54. 97–107. 2585

Although little or no new positive information is presented, the authors have condensed into a small paper a comprehensive survey of the pathology of grass sickness. The original should be consulted by all interested, as the paper is too factual to be easily abstracted.—G. B. S. HEATH.

BOSNIĆ, L., & RAPIĆ, S. (1941.) Adams-Stokesov sindrom kod parcijalnoga srčanoga bloka konja. [The Adams-Stokes' syndrome in partial heart block in a horse.]—*Vet. Arhiv.* 11. 1–17. [Abst. from German summary.] 2586

The authors describe the treatment of partial heart block in a horse, in which symptoms of Adams-Stokes' disease appeared from time to time during the eight months it was under observation before it died after a severe attack.

The Adams-Stokes' attacks occurred at the

beginning of the illness, in the first month and in the last days of life. Between these two phases there was an interval of almost six months' duration, when attacks did not occur spontaneously and could not be induced artificially.

Histological examination of the heart revealed chronic inflammation in the Aschoff-Tawara node and the His bundle with numerous specific fibres that were damaged or completely destroyed, besides fresh inflammatory processes. The double phases of Adams-Stokes' attacks referred to above can be explained by these histologically established changes.

In the attack-free interval there was bradysystolia of the ventricle, with 16-22 (average 18) contractions per minute, relative to a partial block. The block showed, without any regularity, variations 2:1, 3:1 and 4:1. The action of the atria could be established in the ventricular pauses by auscultation and pulsation of the jugular vein as well as by inspection and palpation through the vibration of the chest wall, and this could be proved by both methods in the fourth intercostal space immediately under the vena thoracica externa. The same proportions in the auricular and ventricular action were established by cardiography and electrocardiography.

The partial heart block could be got rid of neither by application of atropine nor by strenuous physical exertion.

In the course of the attacks the ventricular pause was prolonged to 10, 20, 40 and even to 60 sec. On the last day of life, in the course of which the animal underwent several hundred attacks, the longest measured ventricular pause amounted to 65 sec. The first signs of the Adams-Stokes' syndrome then appeared when the pause began to measure from over 15-18 sec.

The blood pressure in the jugular vein, in the interval free from attacks, was 5-15 mm. Hg and increased during the attacks to 25-30 mm. and occasionally to 50 mm. Hg. The blood pressure in the aorta, measured direct through the rectum in the attack-free interval, was about 130 mm. Hg. During the long ventricular pause this fell to 40 mm. Hg.

ANDERSSON, P., & DREJARE, L. (1946.) Ett fall av senig förbindelse mellan bakbenets ytliga och djupa böjsena hos häst. [A tendinous insertion between the superficial and deep flexor tendons of the hind limbs of a horse.]—*Skand. VetTidskr.* 36. 93-97. [Abst. from English summary.] 2587

The authors describe an abnormal tendinous communication between the superficial and the deep flexor tendons of the hind legs of a horse. The abnormal tendon proceeded from the superficial flexor tendon distal to the tarsus and its

fibres could be followed proximally from within the superficial flexor tendon and distally into the deep flexor. The length of the tendinous strand was 6 cm. and it was as thick as a little finger. In the distal portion it was combined with the check ligament. Both hind legs of the horse had exactly the same abnormality.

DALGAARD, J. B. (1945.) Pancreolithiasis in cattle.—*Skand. VetTidskr.* 35. 362-366. [In English.] 2588

D. examined the pancreas in 153 slaughtered cows, finding three cases of pancreolithiasis among them. In 30 calves examined, no stones were found. The macroscopic, microscopic and bacteriological examinations are briefly described and D. concludes by discussing the aetiology of the condition.—L. M. MARKSON.

KIRK, H., & SAMS, A. (1946.) Diseases of racing greyhounds.—*Vet. Rec.* 58. 323-324. 2589

The most common diseases of greyhounds are distemper, Stuttgart disease, jaundice (simple and leptospiral) and hysteria. The most frequently encountered surgical conditions are sprained shoulders and carpal joints, "knocked-up toe," dislocated scaphoid of the hock, fracture of the hock and of the os calcis, sprain fractures of the patella, phalangeal fractures, track leg in fore and hind limbs and cramp.

The causes, symptoms and treatment of these conditions are described. The necessity for routine use of radiography in diagnosing lameness is stressed.—D. D. OGILVIE.

DOBBERSTEIN, J. (1944.) Der Herztod des Schweines. [Fatal cardiac syncope in pigs.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 3rd. 69-74. 2590

This condition was first described by FREDE in 1926. Generally thriving pigs are attacked, death occurring unexpectedly: the pigs cry loudly, fall down and usually die immediately.

The aetiology of this disease is not clear although usually lesions in the heart wall and circulation can be demonstrated. There seems to be no direct relation between the clinical symptoms and the degree of damage to the heart. Any congestion present in the organs is always of acute character.

The frequent syndrome of a hypertrophied heart together with myocarditis is quite similar to that in Basedow disease in human beings and the search has therefore been extended to the thyroid gland. The typical histological lesions of the thyroid are those of hypertrophy (and later also dystrophy) of the gland.

Whilst it is agreed that these lesions of the thyroid may also occur in other diseases, their frequency of 88% among 65 cases of heart

syncope seems to be significant. That 25% of 300 apparently healthy pigs killed for meat purposes also had thyroid lesions, indicates the frequency of subclinical forms of the disease.

An interesting comparison is made between various typical symptoms of Basedow disease and those occurring in this pig disease, namely, defects of the heart action, fibrillation of the atria, the blood picture, the temperature, intestinal paralysis and later enteritis, muscular weakness and the characteristic epidemiology of both diseases.

The modern trend to breed for early maturity, especially where much inbreeding is carried out, is possibly responsible for the frequent occurrence of the disease. It is characteristic that "bad doers" never have the disease.

It should not be difficult to prevent the disease by making conditions of growth as natural as possible, feeding a well balanced and varied diet and allowing plenty of out-door exercise to the weaned youngsters.

When an outbreak of the disease has occurred at a farm, cooking salt and Glauber salt should be added to a reduced diet. A short period of starvation as well as a liberal vegetable supply should help to reduce further losses.—C. AHARONI.

PALLASKE, G. (1944.) Zum Herztod der Schweine. [Fatal heart disease in swine.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* May 26th. 165-169 & June 9th. 181-185. 2591

The following factors are emphasized with regard to diagnosis of fatal heart syncope:—

The macroscopical examination of the heart must be supplemented in every case by a careful histological examination, and all the other frequent diseases causing changes in the myocardium, such as piglet anaemia, helminthiasis and erysipelas, must be eliminated by differential diagnosis. Many cases of apparently typical fatal heart disease do not, however, have histological lesions of the heart, whereas in many normally slaughtered pigs similar colour changes can be observed macroscopically.

P. found no certain evidence to support the contention of other workers that lesions are to be found in the skeletal musculature: in fatal syncope histological changes do not always occur in the body muscles.

No typical enteritis has been found in connexion with the heart condition, but as the heart attack often occurs at the height of the digestive process, a functional digestive hyperaemia of the gut is often present and must be recognized as such.

It is difficult to prove whether functional changes take place in the thyroid gland. The gland is often, however, found to be composed of

follicles of irregular size with proliferating epithelium, the whole resembling adenomatous changes. But not all normal pigs have normal sized thyroids and not all pigs dead of the heart attack have abnormal thyroids: nevertheless, most have changes in both the myocardium and the thyroid.

The comparative examination of hypophysis, thymus, pancreas, adrenals, brain and spinal cord did not reveal any typical changes in the diseased pigs.

Tentative examination of the blood revealed a slight rise of lymphocytes and serum calcium in affected animals.

It has not yet been proved if the condition is infectious, although recently piglets appear to have been infected by contact. DOBBERSTEIN [see abst. preceding] believes that a toxicosis of the thyroid is the main lesion of the condition and that the occurrence of abnormal thyroids in apparently normal pigs can perhaps be explained by a widely spread latent predisposition among pigs, influenced by heredity and various external factors such as vitamin A deficiency, general nutrition, hygiene, etc. The modern trend to obtain a maximal development of the pig in the minimal time lays great strain on the entire endocrine system and may enforce a hyperfunction and later dysfunction of the gland.—C. AHARONI.

FRITZSCHE, K. (1944.) Beobachtungen über Geflügelkrankheiten in Russland. [Fowl diseases in Russia.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* January 21st. 24-26. 2592

During his work on the eastern front, F. examined about 20,000 fowls and made some 250 histological and bacteriological examinations.

The general standard of poultry was very low, with few examples of typical breeds and no breeding for special purposes; nevertheless, the average standard of health was surprisingly high.

Of all the well known virus diseases, only one outbreak of fowl pest was encountered; most bacterial diseases also seemed to occur very rarely in Russia. No spirochaetosis or pullorum disease was met with, but there was one outbreak of fowl typhoid (*S. gallinarum*): this disease had been endemic in this district for years.

Avian TB. was encountered in 5.2% of the 250 specimens; this was a surprisingly high incidence, because bovine TB. was thought to make up only 0.5% of the abattoir returns in Russia.

Ectoparasites were very rare, even among half-starved and older birds, but helminth infestations were common. Two hundred birds were found to be heavily infected with capillaria, daviaea, ascarids, etc.—C. AHARONI.

WIRTH, D. (1944.) Hämolysische Diathesen bei unseren Haustieren. [**Haemolytic diathesis in domestic animals.**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* July 7th. 218–219. 2593

The possible dietetic causes of puerperal haemoglobinuria in cattle are discussed. Treatment of the condition with repeated blood transfusions, intravenous injection of glucose saline and subcutaneous injection of adrenalin yielded good results. Paroxysmal haemoglobinuria was produced in calves by the ingestion of 10 litres of water. The animals rarely had serious symptoms. Other cases of haemoglobinaemia are described.

—E. F. MCCARTHY.

MAGNUS, H. A. (1946.) **The pathology of simple gastritis.**—*J. Path. Bact.* 58. 431–439. 2594

The object of this work was to examine the claims of Faber, Konjetzny and Konjetzny & Puhl that the structural changes in the gastric mucosa which they described as gastritis were closely related aetiologically to simple peptic ulceration and gastric cancer.

Material used consisted of 20 presumably "normal" stomachs fixed and removed almost immediately after death, and a hundred partial gastrectomy specimens. The histological methods used were fully described by the author in an earlier paper (1937). Bacterial gastritis was excluded from this article, also the non-inflammatory gastritis of Addisonian pernicious anaemia.

The histology and pathology of the different forms of gastritis were discussed in detail, the descriptions being supported by 14 photo-micrographs.

See also absts. 2662–2675 (annual reports).

NUTRITIONAL AND METABOLIC DISORDERS

KLARENBECK, A. (1940.) Spontane en experimentele "vreesziekte" na voeding met hondenbrood. [**Hysteria induced by feeding certain dog biscuits.**]—*Tijdschr. Diergeneesk.* 67. 852–858. [English, French and German summaries : abst. from English summary.] 2596

K. distinguishes between hysteria produced by feeding certain dog biscuits and hysteria possibly caused by virus infection.

HASTINGS, C. C. (1945.) **Nutrition. Material furnished by the Committee on Nutrition. Vitamins in nutrition in relation to animal diseases.**—*J. Amer. vet. med. Ass.* 106. 168–171. 2597

The synthesis of vitamins by the ruminant has been well established. Vitamin K and six members of the vitamin B complex, thiamine, riboflavin, nicotinic acid, pantothenic acid, biotin and pyridoxine are synthesized in the rumen.

In his conclusions the author says: "At least ten per cent of all adults develop a chronic peptic ulcer at some time in their lives and this investigation strongly suggests that such lesions arise on the basis of an erosive gastro-duodenitis". He could not explain, however, why in the ten per cent an erosion should become a chronic ulcer yet in the majority of cases it should heal. He also found that inflammatory gastritis, identical with that found in association with peptic ulceration or occurring alone, was found in association with gastric cancer, though there was no evidence "to support the theory that inflammatory gastritis, or any sequel of it, can be regarded as a pre-cancerous state".—L. M. MARKSON.

STONER, H. B., & GREEN, H. N. (1947.) **Bodily reactions to trauma. The influence of ischaemia on the clotting factor of muscle.**—*Brit. J. exp. Path.* 28. 127–141. 2595

Muscle specimens were prepared from the hind limbs of albino rats by applying a metal clamp to the limb for five hours under ether narcosis, thereafter killing the rat by a blow on the head, sampling the ischaemic muscle and extracting it with 0.9% aqueous sodium chloride. The effect of these extracts on the clotting of freshly prepared oxalate rabbit plasma and in a few experiments rat and human plasma was determined by Quick's method.

The experiments confirmed that ischaemia of muscle tissue increases the clot-promoting activity of saline extracts of it and that this activity is due to thromboplastin. The possible mechanism of this phenomenon is discussed.—L. M. MARKSON.

This synthesis explains the high level of these vitamins in cow's milk. The newborn calf which has the rumen in a relatively undeveloped state needs supplements of vitamins which are later synthesized in the fully developed rumen.

Calf scours of nutritional origin could be prevented by addition of nicotinic acid and vitamin A. The deficiency of vitamin A manifests itself by a variety of symptoms which are difficult to diagnose. Epithelial membranes are mainly affected and are prone to secondary infections. Vitamin A-deficient animals frequently die of respiratory infections. Eye changes are observed such as keratitis and night blindness. Permanent blindness in young calves due to partial closure of the optic foramina and resulting in stricture of the optic nerves is rare. Sterility in farm animals and poor reproductive performance are often observed in vitamin A deficiency. The normal

requirement is about 3,000 I.U. of vitamin A per 100 lb. of body weight or 3-4 times as much if supplied by carotene.

The mineral metabolism depends on the Ca : P ratio of the diet, on the amount of vitamin D in the ration, on ultraviolet radiation and on the activity of the parathyroid gland. When the Ca : P ratio is imbalanced the requirement of vitamin D is increased. Vitamin D-deficient animals have stiffness, swollen joints, a humped-back, buck-kneed stance and spastic seizures. Fragile bones and stiffness are found in older animals. The blood phosphatase is increased in vitamin D deficiency. The requirements of vitamin D for calves are 400-500 I.U. daily per 100 lb. of live weight. Ascorbic acid is synthesized by all farm animals. The level of vitamin A intake seems to affect the synthesis of ascorbic acid. Excessive iodine supplements result in a decrease of ascorbic acid in the blood of cows. There is some evidence that ascorbic acid plays an important part in reproduction, but treatment with ascorbic acid of animals with poor breeding performance is limited in scope. The newborn calf has a high ascorbic acid concentration in the blood and synthesis of the vitamin begins later in life. Administration of ascorbic acid during the first ten days of life may prevent the loss of calves from naval infections and peritonitis.

The vitamin B complex is supplied to the ruminant by microbiological synthesis, but in the pig, the diet must supply thiamine, riboflavin, nicotinic acid, pantothenic acid and pyridoxine. Deficiency of thiamine in pigs is characterized by loss of appetite, unsteadiness of gait, and rarely by a typical beriberi paralysis. The daily requirement is of the order of 1 mg. per 100 lb. of body weight daily. Riboflavin-deficient pigs gain slowly, have loose faeces and walk with difficulty. The requirements for riboflavin are 1-3 mg. daily per 100 lb. body weight. Nicotinic acid deficiency in the pig (swine pellagra) resembles necrotic enteritis commonly attributed to infection by *S. cholerae-suis*. The requirement for nicotinic acid has been suggested to be about 13 mg. per day per 100 lb. body weight. Pigs in dry lot, fed a ration of corn and tankage, often develop a rough coat, gain slowly in weight and have a "goose stepping" gait. This nutritional disease has been attributed to a combined deficiency of pantothenic acid and pyridoxine. The approximate requirements for pantothenic acid and pyridoxine are stated as 8-12 mg. and 5 mg. per 100 lb. body weight, respectively. Under field conditions it is to be expected that combined deficiencies will be observed rather than those due to a single specific vitamin.—E. KODICEK.

SCHOFIELD, F. W., INGLE, R. T., & MCFARLANE,

W. D. (1942.) Vitamin "A" assays of the milk of nursing sows.—*Rep. Ont. vet. Coll.*, 1941. pp. 16-19. 2598

Determinations were made of the vitamin A potency of the milk of nine sows receiving rations which in some instances were of very poor quality, consisting mainly of oat and barley chop and mangolds. In the litters of the sows receiving this inadequate diet, mortality from streptococcal and other infections was high. One sample of milk was taken during farrowing, the others from 12 hours to 33 days after farrowing. The milk was very low in vitamin A, in one instance, where nine out of a litter of 12 died during the first few days, the value was only 30-35 I.U. [? per 100 ml.]. The colostrum contained more vitamin A than the milk. Administration of 30,000 I.U. of vitamin A as haliver oil per sow per day greatly increased the amount present in the milk, and it is suggested that such a supplement should always be given to sows on rations likely to be deficient in vitamin A.—E. M. CRUICKSHANK.

GLUD, P. (1942.) B₁-Vitaminmangel (Beri-Beri) hos Sølvraeve. [Vitamin B₁ deficiency in silver foxes.]-*Maanedsskr. Dyrlaeger*. 54. 65-78. 2599

G. describes a condition of vitamin B₁ deficiency in 57 silver foxes on the same farm, which was due to lack of the usual foodstuffs. Typical symptoms of anorexia, ataxia, cramp, coma and subnormal temperature were present. Treatment consisting of intramuscular doses of aneurin brought about recovery except in three fatal cases. After recovery, depigmentation of the black hairs on the nose and head was observed and attributed to lack of B₁ vitamin [*p*-aminobenzoic acid]. The addition of beer yeast caused the disappearance of the grey colour, but in many cases the pelt became brownish and lustreless, while the white hair, *i.e.*, the silver, remained yellowish. The latter condition had persisted for over six months.—E. F. MCCARTHY.

LABATUT, R. (1945.) La lutte contre la stérilité et la prévention des avortements dépendant de l'état de la nutrition chez les femelles bovines. [The control of sterility and the prevention of abortion caused by malnutrition in cows.]-*Rev. Méd. vét., Toulouse et Lyon*. 96. 258-262. 2600

In the last few years the incidence of female sterility and abortion has shown a steep rise throughout France. In the Landes area, L. examined and treated 426 such animals, of which 77 were anoestrous, 106 had aborted and 243 had been regularly returning to service. A rough form of agglutination test for brucellosis, adapted to field use, was carried out on each animal and

proved negative in all cases. This was confirmed by similar results from all samples from the same region sent to the national diagnostic laboratory.

Among the anoestrous group were six cases of chronic metritis and seven with infantile uterus and doubtful ovarian development. Nine cases are described as of chronic oophoritis, because the ovaries were normal in size but contained no corpora lutea, cysts, or follicles. In 55 cases a persistent corpus luteum was found.

In the returning group it is claimed that persistent corpora lutea were found in each case, but there were no cases of cyst formation. [As the cows had regular oestrus cycles corpora lutea were naturally present between heats; it is difficult to see what L. means by a retained corpus in this connexion.] All the group which had aborted

were already in calf again by the time they were examined.

The anoestrous group were treated with oestradiol benzoate, with corpus luteal enucleation where present. All "silent heat" cases were cured and about 50% of the other types, with the exception of chronic metritis cases, none of which derived any benefit.

Enucleation was accompanied by wheat germ oil injections, for treatment of all the cows returning to service. 98% subsequently conceived to the first or second service.

The group which had aborted, received 1,000 units of vitamin E subcutaneously. 16% aborted again. L. claims the treatment carried the others to term.—F. L. M. DAWSON.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

I. CHADWICK, J. (1947.) *Atomic energy*.—*Lancet*. 252. 315-320. 2601

II. CHADWICK, J. (1947.) *Atomic energy and medicine*.—*Brit. med. J.* Feb. 15th. 263-265. 2602

I. C. traces the development of modern knowledge of the structure of the atom and of the steps which opened up the possibility of securing atomic energy by nuclear fission, *i.e.*, atomic transformation by neutron bombardment.

The two most important aspects of the fission process are (a) that a great amount of energy is released and (b) that more than one neutron is emitted in the fission; this second point is of crucial significance as it opens up the possibility of a chain of reactions developing from a single event and the control of this chain process is of fundamental importance for peace-time applications of atomic energy. To make the reaction self-propagating it was necessary to limit the number of neutrons lost to the reactor, two conditions were essential (a) a certain limiting critical size of the block of fissile material and (b) the system must not contain more than a limited amount of material which absorbs neutrons without undergoing fission. Two successful methods of "moderation" or slowing down of neutrons were by the use of heavy water (relatively very expensive) and of graphite which is relatively cheap and abundant.

A description is given of the graphite pile which consists of lumps of metallic uranium disposed at regular intervals through a large block of graphite, careful attention being paid to the critical size and the system of cooling. The power level of the pile is limited only by the rate at which heat can be removed and by the physical and chemical properties of the materials.

C. then discusses the medical and biological applications of the graphite pile. It can be used as a source of neutrons and gamma-radiation, but so far this has had little therapeutic application although it is a valuable tool for physical and medical research, and it can be used for producing radio-active substances, either by utilization of fission products or by preparation of radio-active isotopes (about 450 known radio-active isotopes of practically all elements have been made so far).

There are three main uses of radio-active substances: (a) in radiotherapy, both in beam therapy and in interstitial and intracavitary therapy, (b) in selective irradiation: radio-active phosphorus has been found to be very effective in the treatment of polycythaemia, useful in myelogenous leukaemia, but of little value in lymphatic leukaemia; radio-active iodine was effective in treatment of overactivity of the thyroid and in a particular but unusual form of thyroid cancer; this method is still in its infancy with so far a limited development and scope, and (c) for use in producing "tracers" or labelled elements: this is considered to be the most promising medical application.

The main ways in which "tracer" technique has been employed are (a) in studying the metabolism of various elements, (b) by remote detection by gamma-radiation and (c) by the use of photographic action of radiations. Particular problems which radio-isotopes have helped to solve include the permeability of the membrane of red blood cells, the effects of X-rays on cellular division, and blood transfusion. The U.S.A. used tracer technique in studies of surgical shock and in the development of methods for the preservation of whole blood for transfusion. This clarified some points concerning the interaction of blood

types and also made an important contribution towards determining the best methods for the preservation of whole blood and establishing U.S.A. standards for blood storage.

C. concludes by expressing the belief that the new technique would considerably hasten progress of the knowledge of fundamental chemical processes in the body and of health and disease. Radio-active materials were essential to the new method, and although the cyclotron could produce such materials, the quantities were relatively small compared with those made by an atomic pile. A single pile of moderate power would be able to supply all the "tracer" elements needed in this country. It has no direct military application, and is without significance for the production of atomic bombs as its rate of manufacture of plutonium is too small. It is essentially a safe development of atomic energy and one which by enabling more to be discovered about the living organism in much shorter time might bring untold benefits in its train.

II. This is an abbreviated version of I, with greater emphasis on the medical applications of atomic energy.—A. EDEN.

PRESCOTT, F., & BASDEN, M. (1944.) **Inhibition of lactation by hexoestrol dipropionate.**—*Brit. med. J.* Sept. 30th. 428-430. 2603

Of a number of oestrogens and androgens and their esters which have been tested, hexoestrol dipropionate has been found to be most effective in inhibiting lactation in women. A single intramuscular injection of 12.5 mg. of this substance, given shortly after childbirth, was successful in preventing engorged and painful breasts in 66% of cases tested; further treatments during the first three days after parturition increased the percentage to 82%. Success was also achieved in checking lactation when it had already become established. Administration by the mouth was less effective.—R. MARSHALL.

VAN DER BERG, W. (1946.) **Quantitatieve bepalingen van lactaten in het bloed van gezonde koeien en van koeien, lijdende aan paresis puerperalis. [The lactate content of the blood of normal cows and cows with milk fever.]**—*Tijdschr. Diergeneesk.* 71. 497-505. [Abst. from English and French summaries.] 2604

Lactates are normally present in the blood of mammals. According to the literature the percentage of lactates in the blood differs in various species of animals. In human blood a larger quantity is found than in the blood of the cow, pig, and sheep. In dogs and monkeys, however, the quantity is larger than in man. These proportions hold good for healthy, resting mammals.

Intense muscular contractions cause the blood lactate percentage to rise considerably in a short time; when a calmer state has been restored it gradually goes down again to the normal level. The lactate produced in the muscles under intense exertion is quickly diffused to the blood, so that from the lactate analysis of the blood it may fairly accurately be calculated what quantity of lactate is to be found in the normal body at the moment of the blood-regression. In many diseases of human beings, e.g., non-compensated heart affections, extensive carcinoma, pneumonia and chronic nephritis, an increased blood lactate percentage was found. No reference to similar investigations of diseases of the large domestic animals was found in literature. In both grass tetany and milk fever there was a considerable increase in the lactate content of the blood. From the clinical picture of the latter disease it seems unlikely that this could be attributed to increased muscular contraction or increased muscular tonus.

HÖFLIGER, H. (1943.) **Die Ovarialgefäße des Rindes und ihre Beziehungen zum Ovarialzyklus. [The ovarian blood vessels of the cow and their relationship to the ovarian cycle.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 11th. 179-181. 2605

H. gives an account of the histology of the ovarian blood vessels throughout the ovarian cycle in the cow. From shortly after birth, when extensive arterial and venous networks can be seen ramifying in and on the maturing ovary, these changes are directly linked with functional activity. The chief means of accommodation appears to be in the nature of the arteriole and capillary walls and the presence of elastic fibres. Arterial anastomoses and arterio-venous junctions are not uncommon. Full details are given, but the illustrations are promised in an article to follow.—C. W. OTTAWAY.

GRAU, H. (1943.) **Artmerkmale am Darmkanal unserer Hausvögel. [The alimentary tract of domesticated birds.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 11th. 176-179. 2606

G. gives a comparative study of the intestines of the hen, duck, goose and pigeon. The pancreas is associated with the looped duodenum in all; the mesenteric suspension is such that in the hen it is closely wedged between the duodenal loops. In the pigeon, a large left bile duct opens into the duodenum near the pylorus, in the others the two bile ducts and two pancreatic ducts open in close proximity to one another near the termination of the duodenum. The jejunum is suspended by a fan-shaped mesentery in the hen, arranged in double spirals in the pigeon and in 5-6 loops in

the duck and goose. An attempt is made to designate the jejunal loops. Meckel's diverticulum, a vestige of the yolk stalk, is present in a high proportion of cases. The caeca of the pigeon are very small, but in the remainder are of approximately equal length, running the length of the ileum. Details are given of the position of viscera and of the bursa of Fabricius.—C. W. OTTAWAY.

FISCHER, E. (1943.) Kernreihen in den Herzmuskelfasern des Schweines. [Arrangement of nuclei in the heart muscle in pigs.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 104–105. 2607

Sections of heart muscle taken from ten pigs 8–9 months old were examined to determine the normal arrangement of the muscle nuclei. In all cases nuclei were found grouped in rows of 3–12 per row. More rows were found in sections of the ventricles than of the auricles, the greatest concentration being present in the left ventricle. The nuclei exhibited considerable variety in shape and size and this is illustrated. Findings in the hearts of wild pigs were similar.—C. W. OTTAWAY.

PHELPS, D. (1946.) Endometrial vascular reactions and the mechanism of nidation.—*Amer. J. Anat.* 79. 167–197. 2608

The changes in the coiled arteries which characterize the normal menstrual cycle have been produced experimentally in the rhesus monkey: those characteristic of the ovulatory cycle were produced when progesterone was administered together with oestrogen and those characteristic of the anovulatory cycle were produced when oestrogen only was administered. When both hormones were given, arterial growth resulted in a close approximation of arteries and endometrial surface at a stage of the experiment corresponding to the time of nidation. The coiled arteries did

not approach the surface when only oestrogen was given. It is suggested that the action of progesterone in producing a rich blood supply just under the endometrial surface is important for the nutrition of the ovum.—J. M. ROBSON.

I. McMASTER, P. D. (1946.) The pressure and interstitial resistance prevailing in the normal and edematous skin of animals and man.—*J. exp. Med.* 84. 473–493. 2609

II. McMASTER, P. D. (1946.) The effects of venous obstruction upon interstitial pressure in animal and human skin.—*Ibid.* 495–509. 2610

I. Determination of pressure in cutaneous connective tissue is extremely difficult on account of the necessity to avoid artificial pressures resulting from the experimental procedure. In these experiments intracutaneous pressure was approximated by injecting into skin exceedingly small amounts of a relatively unabsorbable fluid, a mixture of Locke's fluid and a vital dye [pontamine sky blue] and then finding the least pressure required to overcome the resistance of the skin to the passage of the fluid. This pressure was termed the interstitial resistance. Results are given for normal pressures in man and laboratory animals and compared with pressures in oedematous skin which have been measured directly. Details are also given and discussed of pressures in various forms of oedema.

II. Similar experiments were undertaken to record intracutaneous pressures in cases of true venous obstruction effected by obstructing the venous return with almost unhindered arterial flow. Following an initial rise, the pressure remained constant and it is suggested that the escape of fluid from the capillaries is checked at this point. The results and those of earlier workers are discussed.—C. W. OTTAWAY.

See also absts. 2678 (medical biochemistry), 2679 (forensic chemistry).

POISONS AND POISONING

ROSENFELD, I., & BEATH, O. A. (1946.) Pathology of selenium poisoning.—*Bull. Wyo. agric. exp. Sta.* No. 275. pp. 27. 2611

Observations were made on range animals, ten with acute poisoning, five with "alkali disease" and ten with "blind staggers" (the paralytic type of chronic selenosis). Included in this study yearling ewes, divided into three groups, were also used as experimental animals, the selenium being administered by drenching. Group I received selenium until signs of the poisoning appeared, when administration was discontinued, the animals being killed 61 days later. Group II received selenium until they died, six sheep receiving 1,922 mg. each in 116 days, the other

three 632 mg. each in 64 days. Group III acted as controls, receiving no selenium, but being fed on the same diet as the other two groups of ewes. Group I was considered as having subacute selenium poisoning; group II represented the chronic type, the so-called "blind staggers". The acute cases investigated were among animals which had died from eating seleniferous plants.

Macroscopically, acute poisoning was characterized by generalized haemorrhages and atony of smooth muscle, subacute poisoning by increased fibrosis in all organs, chronic "blind staggers" by acute exacerbations superimposed upon a chronic degenerative process, all organs having chronic degenerative changes plus acute toxic

reactions, and in chronic "alkali disease" there were progressive degenerative changes, the severest being in the heart and liver. Ascites was common in all types.

The authors describe the histology of the various types of the disease, illustrating their description by 19 photomicrographs. The relationship between the pathological changes and the functional disorders is discussed.—L. M. M.

MADIGAN, D. G., SWIFT, P. N., & BROWNLEE, G. (1947.) **Clinical and pharmacological aspects of the toxicity of streptomycin.**—*Lancet*. 252. 9-11. 2612

A series of 17 batches of streptomycin prepared by the Wellcome Foundation were all free

from histamine like impurities but one batch had antidiuretic properties. In this series the potency of the preparations was related to the toxicity. Toxic impurities may be present as contaminants in some preparations of streptomycin. Eleven patients were given 1.2 g. daily of the Wellcome Foundation streptomycin by intermittent intramuscular injection for 90 days without serious toxic manifestations. [These findings are different from those of the National Research Council [U.S.A.]—see *V. B.* 17. abst. 2618—who found toxic reactions in patients receiving more than 1 g. daily. The toxic reactions were ascribed to streptomycin and not to impurities.]

—E. BOYLAND.

PHARMACOLOGY AND THERAPEUTICS

GAUTIER, R. (1945/46.) **The Health Organisation and biological standardisation. (Second memorandum.)**—*Bull. Hlth Org. L.o.N.* 12. 1-75. 2613

In a previous communication [*Bull. Hlth Org., L.o.N.* 4. 497] an account was given of the work on biological standards accomplished from 1921 to 1935. The present article discusses the substantial advance made since that date.

It has been agreed by the Health Organisation's Permanent Commission that any measurement in internationally recognized units must be made with reference to an accepted standard. In many cases of bacterial products, the standard is a dried sample of an antitoxic serum kept at one of the recognized centres. During the past ten years, some of the original international standard preparations have neared exhaustion and have been replaced by new samples. It has thus become necessary to redefine the units in terms of the latter. The methods of assessing the value to be given to these biological products are discussed. The ideal would be to select one sample of antitoxin, one sample of toxin, and one method of test since variations in any one of these components is likely to lead to variable results. Nevertheless, it is considered desirable to leave some freedom of choice, partly to stimulate further progress and partly on account of uncertainties in the qualitative components of toxins prepared from different strains and in different ways, and to acknowledge the difficulty in judging the exact significance of any particular biological test in terms of the protective power of the preparation in the human or animal disease for which it is used. For example, in the case of tetanus antitoxin, the potency as determined by the mouse test is not always the same as by the g. pig test. This is probably due to the existence of several antigenic components of tetanus toxin and information at

present available does not indicate which of these is of primary importance in the clinical use of the serum.

The main part of the article is concerned with the precautions taken during the war to safeguard the international standards and describes in some detail the progress made in recent researches on the methods of standardizing each product. There is also a comprehensive section on the standard vitamins and oestrogenic and other hormones. These sections should be consulted by those interested. The appendix contains a list of existing international standards and their locations and a full bibliography of recent literature on this subject.—R. E. GLOVER.

KHAIRAT, O. (1946.) **The bactericidal power of the blood for infecting organism in bacteraemia.**—*J. Path. Bact.* 58. 359-365. 2614

Samples of defibrinated blood from 21 patients with positive blood cultures were tested for their bactericidal power against the organisms grown from the blood. The purpose of this investigation was to test the method of selecting from a mixture of organisms those of aetiological importance by their resistance to the action of the blood. It was found that under these experimental conditions the blood had a bactericidal action against certain species, or even certain strains, but this action was not always absent against the causative organisms as assumed in the pathogen-selective culture method, which, however, differs in important experimental details.

—A. MAYR-HARTING.

GINIÉIS, MALTERRE & WILCZYNSKA. (1941.) **Emploi des sulfamidés dans le traitement de la mammite des brebis. [Sulphonamides in the treatment of mastitis in the ewe.]**—*Bull. Acad. vét. Fr.* 14. 16-21. Discussion p. 21. 2615

An outbreak of mastitis among ewes is

described. The traumatic origin of the disease, which results in damage to the teats and later the udder, is emphasized. Abscess formation or gangrene were common sequelae.

Treatment consisted of three subcutaneous injections of 5 ml. of a 10% solution of soluseptasine given at intervals of 2-3 days. The cases are divided into four types according to their severity and a description of the lesions and the results of treatment are given. The authors conclude that this is a hopeful method of treatment and that even in those cases which are too advanced for cure of the udder, the systemic effect is abated and the animal's life is saved.

In the discussion the lack of bacteriological examination was regretted as many of the organisms associated with mastitis in ewes are insensitive to sulphonamide therapy. The authors claim that, from the blue-green colour of the pus the Preisz-Nocard bacillus was the causal organism of the abscesses [but this colour is more a characteristic of the host than of the parasite].—C. D. W.

MACLAY, M. H., RANKIN, J. D., LOOSMORE, R. M., & SLAVIN, G. (1946.) **Experimental *Staphylococcus aureus* mastitis in sheep. Treatment trial with sulphonamides or staphylococcus toxoid.**—*J. comp. Path.* 56. 139-147. 2616

The authors attempted to assess the therapeutic value of sulphapyridine, sulphathiazole and staphylococcus toxoid in acute staphylococcal mastitis in the ewe.

In a preliminary experiment it was found that 1 ml. of a 1:10 dilution of a 24-hour serum broth culture of a strain of *Staph. aureus* injected into the udder produced severe mastitis which progressed towards necrosis and sloughing of part of the udder. This dilution was used in the treatment trial. Thirty-six ewes were infected by injection through the teat canal of one-half of the udder. As soon as clinical diagnosis of mastitis could be made, *i.e.*, 12-13 hours after infection, groups of nine ewes were treated as follows: (1) kept as untreated controls, (2) given sulphapyridine by mouth, (3) given sulphathiazole by mouth, and (4) given staphylococcus toxoid. The majority of ewes in each group developed a severe mastitis the course of which appeared to be unaffected by any of the treatments. Examination of the blood and milk from ewes in the sulphapyridine and sulphathiazole groups showed the doses of these drugs to have been adequate. The antibody content of the sera of the ewes was not tested.

Bacteriological examination of the milk was carried out prior to artificial infection. Five of the milk samples of seven ewes, which had only slight symptoms following artificial infection, were infected (three with haemolytic staphylococci, one with non-haemolytic staphylococci and one

with haemolytic streptococci). Only one of the milk samples from 29 ewes which developed severe symptoms following artificial infection, revealed the presence of bacteria (non-haemolytic staphylococci) prior to infection.

Haemolytic staphylococci were isolated from the secretion from all the infected halves of udders after inoculation.

Bacteriological examinations of blood samples from the control sheep were made at the sixth, 12th, 18th, 24th and 48th hours after infection. Haemolytic staphylococci were isolated on only three occasions and, as the possibility of contamination of these samples was not ruled out, the authors concluded that bacteraemia is not a feature of staphylococcal mastitis in the ewe.

—ANGUS FOGGIE.

SUCHECKI, A. I. (1946.) **Allergic reactions to penicillin.**—*Brit. med. J.* Dec. 21st. 938-940. 2617

The literature is reviewed and 38 cases are discussed. The allergy is truly to penicillin and the rate of occurrence is probably about 0.5%. There may be general reactions when the drug is given systemically (urticaria, serum sickness, fever, etc.) or local reactions when the drug is applied locally. Nine new cases are described, including four cases of hydrarthrosis in which there is swelling, especially of the small joints. The skin sensitivity test does not give constant reliable results. Adrenalin, ephedrine and "benadryl" are suggested for treatment.—J. M. R.

ANON. (1946.) **Streptomycin in the treatment of infections. A report of one thousand cases. [Committee on chemotherapeutics and other agents: National Research Council.]—J. Amer. med. Ass.** 132. 4-11 & 70-77. [Author's summary and conclusions copied *verbatim*.] 2618

Streptomycin is a potent antibacterial agent that can be given intramuscularly or subcutaneously or injected directly into the subarachnoid space or the pleural or peritoneal cavity. Very little is absorbed from the gastrointestinal tract.

The intramuscular route is the one of choice.

Following intramuscular injection, streptomycin is excreted in the urine and bile. It is necessary to maintain a concentration of the drug in the blood and tissues that is at least four to eight times that required to inhibit the organisms *in vitro*. It is necessary to repeat the injections every three or four hours.

The dosage of streptomycin depends on the type of infecting organism. It is desirable to deliver and maintain a sufficient amount of streptomycin at the site of the lesion so that the concentration is four to eight times that necessary to kill the organisms *in vitro*. One to 4 Gm. a

day for five to fourteen days may be required in certain acute infections.

In the treatment of empyema or meningitis it is advisable to use streptomycin topically by injecting it directly into the pleural cavity or the subarachnoid space. Streptomycin has been most effective in the treatment of tularemia, *Hemophilus influenzae* infections, urinary tract infections due to gram-negative bacilli, bacteremias and meningitis due to gram-negative bacilli. The results in typhoid, brucellosis and *Salmonella* infections have been disappointing and inconclusive.

The results in experimental and clinical peritonitis are sufficiently impressive to warrant a much more clinical study. The same can be said for pulmonary infections due to Friedländer's bacillus and other gram-negative bacilli.

Further studies in tuberculosis are urgently needed as soon as adequate supplies become available.

Untoward reactions are not infrequent and increase in frequency with increasing dosage. They consist of histamine-like reactions, headache, flushing of the skin, neurologic disturbances, vertigo and paresthesias, hypersensitive reactions, fever, skin eruptions and eosinophilia.

ALEXANDER, H. E., & LEIDY, G. (1946.) **Influence of streptomycin on type b *Haemophilus influenzae*.**—*Science*. 104. 101-102. 2619

A number of strains of Type b *H. influenzae* were tested after growth on Levinthal broth or agar, and found to be highly sensitive to streptomycin *in vitro*. By subculturing, most of the strains became highly resistant to streptomycin *in vitro* and mice infected with these resistant strains were not cured by the drug. Hence a single *in vitro* test should suffice for assaying the sensitivity of strains from patients to be treated with streptomycin. Encouraging results have been obtained in the treatment of ten cases of influenzal meningitis with streptomycin.

—J. M. ROBSON.

GUTMANN, M., TROCKMAN, R., & IVY, A. C. (1946.) **The concentration of streptomycin in dog bile.**—*J. Lab. clin. Med.* 31. 1313-1316. [Authors' summary copied *verbatim*.] 2620

Studies on streptomycin in hepatic and gall bladder bile of twenty-three dogs were conducted. High levels of streptomycin were observed in both hepatic and gall bladder bile when relatively large doses were given slowly intravenously. The liver was observed to concentrate streptomycin in one experiment. The gall bladder does not concentrate streptomycin. The salt of streptomycin, being soluble in saline solution, is apparently absorbed along with water and electrolytes when the bile is concentrated by the gall bladder.

KUBES, V. (1945.) **Ensayos terapeuticos con 4:4' diamidino-stilbeno y 4:4' diamidino-difloxipentano el las tripanosomiasis de ganados equino y bovino (*T. venezuelense* y *T. vivax*) en Venezuela. [Treatment of equine and bovine trypanosomiasis (*T. venezuelense* and *T. vivax* infection) with stilbamidine and pentamidine.]—*Cuad. verd. 3a Conf. interamer. Agric., Caracas*. No. 51. pp. 29. [English summary.] 2621**

By using stilbamidine and pentamidine in the experimental treatment of horses infected with *T. venezuelense* [= *T. evansi*] and cattle infected with *T. vivax*, it was found that the intravenous injection of stilbamidine caused a severe reaction in horses with hyperaesthesia and dyspnoea and that a dose of 5 mg. per kg. body weight might prove fatal. A dose of 1 mg. per kg., which might be repeated, given subcutaneously, was used for the experiments. Cattle tolerated the drug well intravenously and withstood even a dose of 7.5 mg. per kg.

Pentamidine had no immediate toxic action, but appeared to have a delayed toxicity, with loss of appetite, nervous disorders, and fatty degeneration of the liver. Though both compounds caused the disappearance of trypanosomes from the blood for long periods, relapses occurred even after repeated treatment, except in the case of cattle treated with stilbamidine in which sterilization appeared to be effected with a dose of 5 mg. per kg., repeated if necessary when relapses occurred. It was shown that animals cured by treatment could be reinfected by inoculation.

It is concluded that stilbamidine is a valuable remedy for *T. vivax* infection in cattle, but is inferior to Bayer 7602 which is claimed to be an authentic specific.—U. F. RICHARDSON.

POPOV, P. I., & DEGTYAREV, M. V. (1943.) **O lechenii gemosporidiozov loshadei novoplazminom (LP₄) i sporoplazminom (LP₃). [The treatment of equine piroplasmosis with novoplasmin (LP₄) and sporoplasmin (LP₃).]**—*Veterinariya, Moscow*. No. 12. pp. 30-32. 2622

The value of the two synthetic compounds [composition not stated] in the treatment of equine piroplasmosis was tested on 66 horses naturally infected with *B. caballi* or *N. equi*, or both organisms. Sixty animals recovered and four died, it being claimed that the latter were treated too late to be able to respond. The drugs could be inoculated intravenously or subcutaneously, but "novoplasmin" caused inflammation and abscess formation if injected subcutaneously at a concentration of over 1%.

Observations were made on the pulse, temperature, respiration, blood pressure and number of parasites in the blood of each animal before and at intervals after treatment. Clinical recovery

occurred in 2-3 days after treatment, piroplasms gradually decreasing in the blood, though rare organisms persisted. A noticeable feature was the low arterial blood pressure in animals before treatment and the rise after treatment. In some cases the blood pressure failed to respond and it is suggested that the nature of its response is a valuable guide in prognosis. The drugs may cause a severe nervous reaction.—U. F. RICHARDSON.

CHERKASSKIĬ, E. S. (1945.) Terapiya i profilaktika chesotki i gemosporidiozov s- kh. zhivotnykh preparatami piretruma. [Therapy and prophylaxis of scabies and piroplasmosis with pyrethrum preparations.]—*Veterinariya, Moscow*. No. 1. pp. 24-27. 2623

Details are given of laboratory, small scale and full scale field tests on the effect of pyrethrum preparations in the clearing of farm stock of *Psoroptes equi* var. *ovis*, *Boophilus calcaratus*, *Hyalomma marginatum*, *Hyalomma detritum*, *Rhipicephalus turanicum*, *Rhipicephalus bursa* and *Demacentor marginatus*.

Two preparations were used as the basis:—(a) powder from the dried flowers, stalks and leaves of *Pyrethrum cinerariaefolium*, *P. roseum* and *P. corneum* with a content of 0.3% pyrethrin I and II and (b) saponaceous oleoresin as a thick, dark green paste containing 2% pyrethrin I and II.

C. regards emulsions of the oleoresin, suspensions of the powder, and dusts of the powder as highly effective as therapeutic and prophylactic means of attack on *Ps. equi* var. *ovis* and on ticks in all stages of growth including the egg. The dust is most effective if preceded by a preliminary application of a paste.

Scabies in sheep is cured by preliminary dipping of all obviously affected sheep in an emulsion of oleoresin or a 0.02% suspension of pyrethrin I and II, followed by bathing of all contacts in a bath of oleoresin emulsion (concentration 0.006% pyrethrin) or in a bath of pyrethrum suspension (concentration 0.010% pyrethrin). Even weak and young sheep stand such a dipping with no ill after effects or poisoning.

Treatment of sheep for scabies with pyrethrum preparations also eliminates ectozoa and parasites: lice, nits, sheep keds and ticks.

Dusting with pyrethrum powder with preliminary application of paste on each animal frees the animals from tick carriers of piroplasmosis and protects from fresh infection for ten days. Without the prior application the treatment is less effective and does not last longer than seven days.

—S. W. SALTER.

HEILMAN, F. R., & HERRELL, W. E. (1944.) Penicillin in the treatment of experimental

leptospirosis icterohaemorrhagica (Weil's disease).—*Proc. Mayo Clin.* 19. 89-99. 2624

The distribution, clinical symptoms and treatment of human *L. icterohaemorrhagiae* infection are discussed, and the experimental treatment of infected g. pigs is recorded. The early study was complicated by the low virulence of the culture strain of leptospira (overcome by 11 rapid passages) and the toxicity of penicillin to g. pigs with the production of generalized vaso-dilatation. Finally, 800 units of calcium penicillin suspended in sesame oil and given subcutaneously were selected as the daily dose, being divided into two doses of 200 units and one of 400 units for administration.

With treatment commencing 17-24 hours after inoculation with 2-3 ml. of leptospiral blood, 20 out of 32 g. pigs remained clinically healthy, nine developed fever 3-7 days after treatment, but responded to a second course, and three died from what appeared to be the toxic effects of penicillin. Of 32 controls, 29 died and three recovered, but in two of the latter no lesions of leptospirosis were observed on P.M. examination.—U. F. R.

*ANON. (1941.) Wirksame Massnahmen gegen die Beschälseuche. [Curative treatment of dourine.]—*Mitt. landw. Türkei*. November. pp. 6-7. [Abst. from abst. in *Z. Veterinärk.* 54. 340.] 2625

For the treatment of dourine neosalvarsan, naganol [antrypol] and antimosan are recommended. The dose of neosalvarsan is given as 4 g. per 100 kg. body weight, repeated after 24 hours. A total dose of naganol of 1 g. per 50 kg. can be given in three parts at weekly intervals, or a naganol-antimosan mixture can be used. A dose of 4 g. naganol dissolved in 40 ml. antimosan is given intravenously, and repeated after three days, followed by an injection of 40 ml. antimosan three days later.—U. F. RICHARDSON.

FLÜCKIGER, G. (1947.) Ergänzung der Gesetzgebung zur Bekämpfung der Räude und der Geflügelpest. [Supplement to the legislation for the control of mange and fowl plague.]—*Schweiz. Arch. Tierheilk.* 89. 135-137. 2626

Bovine mange is now made notifiable, in addition to mange of horses, sheep and goats.

In an outbreak of fowl plague the veterinary surgeon must isolate the infected area for at least 14 days after the recovery or slaughter of infected birds. Special precautions must be taken to prevent the spread of the disease if the infected poultry or eggs are to be used for food.—C. A.

ERNST, A. M., & MEIJERS, J. H. (1946.) Onderzoeken naar nieuwe bestrijdings-middelen tegen ectoparasieten. [Investigations on new control methods against ectoparasites.]—*Tidj-*

schr. Diergeneesk. 71. 664-667. [Abst. from English summary.] 2627

In comparative tests with chlorine derivatives of aromatic compounds, 2:4:6-trichlorophenol appeared to give the most satisfactory results. Used as a 0.5% powder preparation, it was as effective against fleas as a 5% preparation of D.D.T. Against lice it was even more effective than D.D.T. As it is soluble in water it may be applied as a 1:1,000 solution and one treatment appeared to be sufficient to kill lice and eggs. The substance was not toxic for cats or dogs under conditions tested.

HAWKINS, P. A., COLE, C. L., KLINE, E. E., & DRUDGE, J. H. (1944.) **Studies of sheep parasites. II. Winter treatment of the breeding flock. III. Treatment of the lambs.**—*Quart. Bull. Mich. agric. Exp. Sta.* 27. 67-81 & 82-95. [For part I, see *V. B.* 14. 305; for parts IV & V, see *V. B.* 16. 48.] 2628

II. Parasitic diseases are the most important cause of losses in lambs, but the use of phenothiazine prevents deaths, and reduces parasitism to low levels. Work reported in this paper was concerned with a study of the level of parasitism in the progeny of ewes from which internal parasites had been practically eliminated.

Treatment with phenothiazine or copper-nicotine sulphate had no harmful effects on pregnant ewes. 160 ewes were kept indoors from November until 20th May the following year and divided into groups as follows:—(1) 40 untreated; pens cleaned January 7th and May 1st, (2) 40 dosed with 4 oz. 1% copper-nicotine sulphate on December 11th, January 25th and April 28th; pens cleaned January 7th, February 15th, and May 1st, (3) 40 dosed with 25 g. phenothiazine on December 18th and April 23rd; pens cleaned January 7th and May 1st, and (4) 40 dosed with 25 g. phenothiazine on November 28rd, January 25th and April 23rd; pens cleaned January 7th, February 15th and May 1st. A further 50 yearling ewes were treated in the same way as group (4). Egg counts on faeces from ten sheep in each group were made at intervals and egg counts on the lambs before they were given any treatment.

Some blood studies were also undertaken.

The authors conclude that treatment of ewes with phenothiazine before going to pasture results in a lower level of parasitism in their lambs, but that pre-lambing treatment with copper-nicotine sulphate is not justified. Midwinter cleaning of the pens also resulted in a lower level of parasitism in the ewes in spring.

III. The most important problem in the management of a lamb flock is the use of anthelmintics to prevent not merely death, but impairment of health. Lambs were divided into the

following groups:—(1) seven untreated, (2) nine given 12.5 g. phenothiazine each [presumably at monthly intervals], (3) nine dosed with 2.5 ml. tetrachlorethylene in capsules, (4) nine given 1 oz. 1% copper-nicotine sulphate at 28-day intervals and (5) 90 given a 1:14 mixture of phenothiazine and salt. Groups (1) and (5) were run on separate pastures and groups (2), (3) and (4) on a third pasture of similar quality, after all groups had run together from May 20th (when they came from indoor quarters) until treatment was commenced on July 27th. A further group of parasite-free lambs was kept indoors for purposes of comparison.

Phenothiazine as a drench brought the lambs' worm burden to a low level, but copper-nicotine sulphate, tetrachlorethylene, and phenothiazine in salt had little effect on the egg counts recorded. However, groups (2), (3) and (4) ended the pasture season 20-30 lb. lighter than either the control or the phenothiazine-salt lambs, presumably as a result of the setback associated with monthly dosing with large amounts of anthelmintic.

—G. B. S. HEATH.

SCHILL, E. (1943.) **Pharmakologische Untersuchungen an Ascariden. [Anthelmintics for ascarid infestation.]**—*Dtsch. tropenmed. Z.* 47. 105-122. 2629

This is a report of numerous experiments carried out *in vitro* on ascarids taken from swine. Some biological experiments on the behaviour of these worms in the intestine were first carried out. Worms were put into a tube through which was passed a stream of water and it was observed that at a certain speed of the water the worms kept their position head-on to the stream by snake-like movements and at the slowest speed they could sometimes be observed making headway. Using this apparatus it was determined that certain chemicals could penetrate through the skin, the substance in solution being applied to the front or rear half of the worm only. The usual way in which ascarids are influenced chemotherapeutically, however, is by ingestion. This can be shown very clearly by the application of dyes to water containing the worms. For instance, the fact that methylene-blue was ingested was shown by transferring worms from water containing the dye into fresh water and observing the expulsion of a drop of blue fluid from the mouth and the anus. The dye could also be detected in the gut, where it is present in the reduced form.

In the anthelmintic tests, solutions of drugs were added to water and to diluted small intestine content containing ascarids and held at 28-30°C. for various periods. The only way of detecting anthelmintic action was through observations on the motility and speed of action, as observed

through the speed at which paralysis occurred and by observations on a number of worms dead at the end of the test period. As it was usual to employ several worms for each test the results were also influenced by the number in the group which reacted, so that it is difficult to give the results in reliable numerical terms. In this work results are given in tabular form and also by statistical formula, for which it is necessary to study the original. General conclusions are, however, describable as follows.

The drugs employed included aqua chloroform, alcohol, oil of chenopodium, paraldehyde and combinations of these, each and all in varied concentrations. All these substances were active both in water and in dilute intestinal material and usually less so in the latter. But the principle result of the work was a demonstration of superior and synergistic action by combinations of these substances. Thus, the most active mixture consisted of all four drugs together.

S. evidently intends to produce a mixture for use in human medicine, administration to be by capsule designed to be dissolved at the top of the small intestine.—J. E.

*LO, C. S., & WONG, T. Y. (1943.) **Some experiments on the efficacy of *Tripterygium wilfordii* for the treatment of tapeworm and roundworm in chickens.**—*Chin. J. Sci. Agric.* 1. 60–62. [Abst. in *Biol. Abstr.* Sect. F. 19. No. 2. 47, slightly amended. Signed: F. A. WANG.] 2630

The wild plant, *T. wilfordii* of Chekiang and Kiangsu is generally used by the farmers as an insecticide for vegetables. The insecticide was used for the treatment of tapeworm and roundworm in chickens for the present experiments. As the results of the efficacy are inconsistent, from 0 to 100%, no conclusive statement could be made.

SURNACHEV, A. V. (1943.) **Terapiya i epizootologiya infektsionnoi zheltukhi. [Therapy and epidemiology of infectious jaundice of cattle.]**—*Veterinariya, Moscow.* No. 10–11. pp. 17–18. 2631

An outbreak of disease in cattle and sheep at a collective farm in the summer of 1943 is ascribed to infectious jaundice on account of the clinical symptoms and pathological findings. The first cases occurred amongst cows and later cases amongst calves born the previous year. It is suggested that the infection persisted in stalled animals during the winter and spread rapidly amongst the cattle and sheep of the farm by contact on pastures in the summer.

Cattle had fever, loss of appetite and diminished milk yield, and blood stained urine and jaundice after 2–3 days. In the later stages, skin

necrosis might occur. The disease ran an acute course, but cases might be mild progressing to recovery. No piroplasms were detected. In sheep the symptoms were similar, but the disease was mild.

Control measures consisted of the isolation of animals with symptoms or fever, and their treatment with ammargen, which S. recommends should be prepared on the spot, from spirits of ammonia and silver nitrate, 0.06 ml. per kg. body weight was given, with a second dose in 2–3 days. All uninfected animals were treated with 0.03 ml. of ammargen per kg. body weight. In working animals rest should be given after treatment, or breakdowns may occur in 10–15 days. 1,500 cattle and 2,000 sheep were treated with ammargen without accident, and the outbreak was successfully suppressed.—U. F. RICHARDSON.

MUTH, O. H., & MORRILL, D. R. (1946.) **Control of enterotoxemia (pulpy kidney disease) in lambs by the use of alum precipitated toxoid.**—*Amer. J. vet. Res.* 7. 355–357. 2632

Trials involving groups of five lambs each showed that a standardized alum-precipitated toxoid is capable of producing within 18 days much higher antitoxic titres than occur in lambs which have received doses of *Cl. welchii* Type D antiserum two days previously. Field trials of the toxoid gave inconclusive results because farmers refused to keep adequate controls, and P.M. examinations were rarely possible, but the authors conclude that the method holds some promise.—G. B. S. HEATH.

FLORIO, R., & MONTEL, G. (1946.) **Le diphénylhydantoinate de sodium dans le traitement de l'épilepsie, chez le chien. [Sodium 5,5-diphenylhydantoinate in the treatment of canine epilepsy.]**—*Rev. Méd. vét., Lyon et Toulouse.* 97. 49–64. 2633

Diphenylhydantoinate of sodium (D.P.H.S.) is recommended as an anticonvulsant in true epilepsy of the dog. The animal should first be examined to ascertain if the convulsions are due to trauma or parasitism and treatment attempted only if results are negative. Doses of 0.1–0.3 g. daily are given for several months and then reduced to 0.02–0.1 g., but they are increased again if the convulsions recur. The daily dose is divided into three and administered finely powdered in food. No effect is obtained at first as the necessary accumulation is not complete for 3–8 days, and, during this period gardenal [a barbiturate] can be administered in decreasing doses. Of 25 dogs treated, six recovered completely with complete disappearance of fits, three improved considerably, two improved slightly and nine completely failed to improve, but two of these

had slight improvement with gardenal. Bromides and boron salts (boron potassium tartrate) had no effect on them.—R. MACGREGOR.

ROBERTS, J. G. (1946.) **Disappearance of secondary sarcomatous deposits in the lungs after stilboestrol therapy.**—*Brit. med. j.* Nov. 9th. 693-694. 2634

A primary malignant endothelioma in the deltoid muscle of a young woman was adherent to the periosteum of the humerus and to the capsule of the shoulder joint. Secondaries appeared in the lungs after a fore-quarter amputation, but these disappeared radiologically when stilboestrol therapy was instituted and had not re-appeared two years later when the case was recorded.—JOHN G. CAMPBELL.

LEWIS, L. A., & PAGE, I. H. (1946.) **Method of assaying steroids and adrenal extracts for protective action against toxic material (typhoid vaccine).**—*J. Lab. clin. Med.* 31. 1925-1929. [Authors' summary copied *verbatim*.] 2635

A method has been described for determining the relative protective power of adrenal extracts and steroids against the toxic effects of typhoid vaccine on adrenalectomized rats. Of eleven crystalline compounds studied 11-dehydro-17-hydroxycorticosterone was the most potent. All of those compounds having an oxygen at C-11 exhibited marked power to protect against typhoid vaccine. The natural and synthetically prepared 11-dehydrocorticosterone acetate (compound A acetate) showed identical potency.

JONES, R. P. (1946.) **Studies on the effect of thiourea and allied substances on the thyroid gland and other organs in rats and mice.**—*J. Path. Bact.* 58. 483-493. 2636

The lethal dose necessary to produce 50% of deaths in rats expressed as mg. per kg. body weight was 20-30 of α -naphthyl thiourea, 160-180 of β -naphthyl thiourea, more than 180 each of $\alpha\alpha$ -dinaphthyl thiourea and $\beta\beta$ -dinaphthyl thiourea and more than 1,000 of thiourea, all given orally. Marked pulmonary oedema resulted from single doses of α -naphthyl thiourea, and repeated doses of 10 and 15 mg. per kg. led to diminished growth and thymus atrophy; repeated doses of 1,000 mg. per kg. of thiourea resulted in congestion, depletion of colloid and hypertrophy of the thyroid gland.

Three main types of Golgi apparatus were

See also absts. 2470 (antibiotic—"colicine"); 2499 (moranyl for trypanosomiasis); 2560 (carbon tetrachloride); 2612 (streptomycin).

found in normal thyroid gland cells (a) a loose network, (b) a condensed network and (c) a fragmented network in connexion with several vacuoles or one large vacuole. In the thyroid cells of rats receiving large doses of thiourea for a considerable period, types (a) and (b) alone were found, with hypertrophy of the Golgi apparatus. With long-term repeated doses of α -naphthyl thiourea, (a), (b) and (c) were all found. When tadpoles were kept in thiourea and α -naphthyl thiourea solutions, growth changes were exhibited in the one case, colour changes in the other. Tadpoles fed on the thyroids of rats which had received daily doses for a limited period of thiourea and α -naphthyl thiourea exhibited a number of changes, suggesting that there was still enough active principle left in the thyroids to accentuate metamorphosis.—A. EDEN.

MOXON, A. L., PAYNTER, C. R., & HALVERSON, A. W. (1945.) **Effect of route of administration on detoxication of selenium by arsenic.**—*J. Pharmacol.* 84. 115-119. 2637

Experiments on rats to investigate the mechanism by which arsenic counteracts the toxicity of selenium revealed that the detoxicating action was independent of the route of administration of either the selenium or the arsenic. Arsenic administered subcutaneously protected against selenium given orally or subcutaneously, while arsenic given orally reduced the toxicity of selenium given subcutaneously to a greater extent than that given orally. These results do not substantiate the theory that the arsenic acts by inhibiting the absorption of selenium from the gastro-intestinal tract.—R. ALLCROFT.

HECHTER, O. (1946.) **Mechanism of hyaluronidase action in skin.**—*Science.* 104. 409-410. 2638

Hyaluronidase induces spreading only when local interstitial pressure is increased by fluid administration. There is no increase in spreading when hyaluronidase plus indicator are placed on superficial epidermal incisions. Since bacteria usually penetrate the skin through abrasions with only minimum amounts of fluid, the spread of organisms through the interstitial spaces will depend as much upon the ability of the bacteria to stimulate the production of oedema-inducing "leucotoxin" as it does upon spreading factor production.—J. M. ROBSON.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

FABIAN, F. W. (1946.) **Significance of thermotolerant and thermophilic bacteria in milk and their control.**—*J. Milk Technol.* 9. 273-278. 2639

Thermotolerant bacteria are defined in dairy bacteriology as bacteria which will withstand the temperature of milk pasteurization, i.e., 140°-145°F. for 30 min. or 160°-161°F. for 15-16 sec.

It is a matter of heat tolerance or resistance and not of growth.

Thermoduric bacteria are chiefly of four classes, micrococci, streptococci, sarcina and bacilli. One of the chief sources is the cow's udder; other sources are utensils poorly sterilized, etc. Most cows have 300-500 bacteria per ml. in milk drawn sterilely and the count may be as high as 3,500,000. It is exceptional for a cow to produce sterile milk.

The thermophilic bacteria on the other hand are more heat-resistant than the thermoduric. They belong to two genera, the *Bacillus* and the *Clostridium*. These organisms are found in the soil, on feeding stuffs, cows' hair, manure and improperly cleansed utensils, especially carelessly sterilized pasteurizing equipment, in which they are propagated.

Measures are enumerated for the detection and estimation of these bacteria and for their control.—D. S. RABAGLIATI.

MICHALKA, J. (1943.) Die Durchführung der biochemischen Fleischuntersuchung in der Praxis. Ein Versuchsergebnis. [Biochemical tests in meat inspection.]—*Z. Fleisch- u. Milchhyg.* 54. 3-6. 2640

The preliminary question of whether the distal muscles of the leg could be used for biochemical tests was investigated, the pH was determined in the muscles of the hind quarter and in the distal flexors in 449 animals slaughtered in emergency.

In 50.7% of the animals the pH was the same in both muscle groups, while in 35.7% there was a slight difference. In 13.6%, only, was there marked difference, most (12.3%) giving a normal reading in the hind quarter musculature but a low reading in the distal muscles. M. concludes that the distal muscles are suitable for pH determination in meat inspection and that unfavourable results of former investigators were due to the fact that they worked with watery extracts of meat containing a considerable amount of connective tissue. M. uses Schönberg's [see *V. B.* 17. 10.] Nitrazine-yellow-method because the small pieces of meat required can more easily be obtained free from connective tissue.

Comparison tests made in the laboratory with those made at the abattoir gave the following results:—In 83.8% the pH figures for the hind quarter musculature were the same in both tests whereas for the distal muscles there was agreement in only 78.4% of cases. The difference of about 5% was due to putrefactive changes which started in the distal muscles because of their higher content of connective tissue and therefore higher pH.

For meat kept in a refrigerator, laboratory and abattoir tests agreed in 80.3% of samples, but in

meat kept at room temperature in 73.7% only.

M. describes three stages in the pH curve (a) a decline of pH from about 6.8 to 6.0 and lower within 24-48 hours after slaughtering, (b) maintenance of the lowest pH figure for 2-5 days and (c) a rise in pH up to alkalinity (commencing at the 3rd-7th day). The course of the curve is determined primarily by fermentative processes and secondarily by bacterial decomposition. In the fermentative action there is decomposition of glycogen and of albumin. In bacterial decomposition there is either a transient increased acidity from decomposition of carbohydrates or a progressive alkalinity from protein decomposition. The keeping property of the meat is represented by the length of the second stage of the pH curve. M. thinks it necessary to determine the pH at least twice with an interval of 24 hours. By this it is possible to judge whether the pH is decreasing, remaining stationary or increasing. A third pH estimation just before the final passing of the meat would be desirable.—P. SASSE.

ALLENSPACH, V. (1947.) Zur Gründung einer schweizerischen tierärztlichen Fachorganisation für Fleischhygiene. [Foundation of a Swiss veterinary organization for meat hygiene.]—

Schweiz. Arch. Tierheilk. 89. 126-134. 2641

Of 697 veterinarians in Switzerland in 1939, 446 were engaged in meat inspection (56 full time, 390 part time), including cantonal and frontier veterinarians. There is need for specialist and revision courses. The present arrangements are inadequate for satisfactory examination of meat, fish and other food and there is lack of liaison with workers in the medical field.—ALAN G. WARREN.

GRÜTTNER, F. (1944.) Über die Beurteilung des fleischvergiftungsverdächtigen Fleisches. [Recognition of meat infected with meat poisoning organisms.]—*Z. Fleisch- u. Milchhyg.* 54. 93-95. 2642

Most organisms causing food poisoning and their toxins were destroyed if meat was thoroughly heated. In meat inspection, therefore, such meat should not be declared as "unsuitable" for consumption but as "conditionally suitable", as was the case in Germany with meat infected with swine erysipelas, TB. or swine fever.

G. agrees with the statement of GLÄSSER [see *V. B.* 15. 243] that the German meat inspection law should be revised in this point. He emphasizes that if suspicious meat is declared as "conditionally suitable" for consumption (with compulsory boiling), the bacteriological examination must by no means be neglected. The bacteriological findings are important for detecting, tracing and controlling infectious diseases, such as anthrax and swine erysipelas.

G. suggests that "conditionally suitable" meat be heated under pressure at 121°C., as in the preparation of tinned meat.—P. SASSE.

WRAMBY, G. O. (1945.) Centralisation eller decentralisation av bakteriologiska köttkontrollen? [The decentralization of bacteriological meat inspection.].—*Skand. VetTidskr.* 35. 719-725. [Abst. from English summary.] 2643

W. describes the findings from bacteriological inspection at Swedish state abattoirs.

Most positive tests are found in summer. During the summer of 1945, comparative bacteriological investigations were made on 19 carcasses, partly at an abattoir laboratory and partly at the State Veterinary Institute after varying periods of time spent in transport. All 19 cases yielded mixed bacterial flora at the State Veterinary Institute, yet 12 of the tests at the abattoir were sterile and only seven positive.

W. concludes that during summer months positive findings are largely due to pollution during transport to the laboratory and consequently he is opposed to centralization of bacteriological meat inspection and is in favour of it being carried out in the abattoir laboratories.

MOOREHEAD, S., & WEISER, H. H. (1946.) The survival of staphylococci food poisoning strain in the gut and excreta of the house fly.—*J. Milk Technol.* 9. 253-259. 2644

Knowing that the common house fly (*Musca domestica*) has been proved to be the carrier of many diseases, the authors endeavoured to prove the importance of the fly for transmitting *Staph. aureus* as a source of food poisoning. The flies were reared under artificial conditions and stock cultures of *Staph. aureus* 611 were used. The experimental food poisoning strain was streaked heavily on tryptose agar plates and incubated. The growth was then suspended on sterile filter pads and fed to flies which had had no food for 24 hours.

The presence of *Staph. aureus* 611 was identified in the digestive tract of such flies for eight days after infection. The actual importance of this means of transmitting the organisms in food poisoning could not be proved, but it is considered that flies may initiate and augment a food poisoning outbreak. Again, the possibility that *Staph. aureus* may commonly be carried by flies was evidenced by the isolation of staphylococci from the digestive tract from ten out of about 50 wild flies examined.—D. S. RABAGLIATI.

ZAGAEVSKY, J. S., & LUTIKOVA, P. O. (1944.) Bacterial contamination in eggs.—*U.S. Egg Poult. Mag.* 50. 75-77 & 88. 2645

The authors review the literature on bacterial

contamination in relation to the preservation of liquid and frozen eggs.

The first part of the review deals with the methods by which new-laid eggs may become contaminated. Reference is made to infection of eggs while still in the oviduct and to infection by penetration of the organism through the shell. The latter may be assisted by the presence of moulds. The germicidal action of egg white (lysozyme) is discussed together with the keeping quality of eggs in relation to the standard of hygiene of egg production.

The second section reviews the literature relating to the alteration of pH in the yolk and white, and how this can be controlled by the temperature and CO₂ content of the surrounding atmosphere.—A. BUXTON.

TEN HOOPEN, W. (1946.) De uitoefening der diergeneeskunde in Nederland sinds het begin der 20ste eeuw. [The development of the Dutch veterinary service since the beginning of the 20th century.].—*Tijdschr. Diergeneesk.* 71. 922-925. 2646

Since the beginning of the century great changes for the better have occurred. These include means of transport, an extension in the scope of the work, the introduction of new medicaments, improvements in instruments, and the introduction of artificial insemination. There has also been a marked improvement in status and scientific standing of the practising veterinarian.—R. PETER JONES.

LEUTHOLD. (1947.) Über das Veterinärwesen in Polen und die Hilfeleistung der Schweiz. [Veterinary services in Poland and the help given by Switzerland.].—*Schweiz. Arch. Tierheilk.* 89. 210-214. 2647

During the war the animal population of Poland was reduced to about 15-25% of its pre-war strength. Most of the contagious diseases are increasing in extent, especially dourine, swine fever and swine erysipelas. There are now only 1,300 veterinarians in Poland and these can rarely do more than give advice as many among them are without instruments or therapeutics. The state veterinary service has been reorganized and an extensive net of modern ambulant clinics all over the country is planned and already partly in existence. The veterinary faculties are situated in Lublin, Warsaw and Breslau. UNRRA has sent very substantial help and Switzerland smaller gift boxes containing books, instruments and medicaments.—C. AHARONI.

I. PROCHÁZKY, A. (1946.) Veřejná veterinární služba. [The Czechoslovak civil veterinary service.].—*Čas. československ. Vet.* 1. 163-164. 2648

II. TOMKA, J. (1946.) Úvahy o veřejném veterinářství. [The civil veterinary service.]—*Ibid.* 164–167. 2649

I. This is a part of the report of the Minister of Public Health to the Czech Parliament. After the war in 1945 a veterinary section was appointed to the Ministry of Public Health, it has two main duties: the inspection of animals and animal products for food and the control of infectious diseases of animals.

The need for eradication of infections such as dourine, glanders and horse scabies which occurred as a result of the war is stressed. During the occupation there was an increase of swine erysipelas, porcine encephalomyelitis, foot and mouth disease and fowl pest. Emphasis is laid on the need for more district veterinary laboratories. To fulfil all requirements about 2,200 veterinarians would be needed. In the period under report there were about 1,100 veterinarians in Czechoslovakia.

II. The civil veterinary service plays a very great role in the field of public health and national economy and T. suggests that it should be organized in an independent Ministry of Public Veterinary Service. Apart from its legislative, educational and administrative aspects, the Czech civil veterinary service is at present divided into three sections, (a) governing the practice of veterinary medicine and surgery, the control of infectious diseases of domestic animals and game, veterinary hospitals and ambulatories, diagnostic laboratories, the production of drugs and biological products, (b) concerning the control of meat and animal products and abattoirs, and (c) to do with the production of all kinds of domestic animals, with hygienic control of stables, foodstuffs, reproduction and so on.—E. PŘIBYL.

*HERRFARTH. (1943.) Achtzehn Monate deutsche Veterinärverwaltung im Bezirk Bialystock. [Eighteen months of German veterinary administration in the Bialystock area.]—*Dtsch. Tierärztl.* 10. 65–68. [Abst. from abst. in *Jber. Vet.-Med.* 71. 302–303.] 2650

H. describes the area administered. It measured 3,140 square km. and was poorly wooded, with light or medium soil with small farms cultivated though not intensively. The population consisted of 1.6 million Poles, White Russians and Jews. 250,000 horses, 530,000 cattle, 920,000 small animals and 960,000 head of poultry were found.

When the German control began, most of the Polish veterinary staff had escaped. The Russians had built many veterinary therapeutic centres, where state veterinary surgeons and assistants worked. No veterinary police or meat inspection had been enforced.

The Germans reinstalled suitable Polish veterinary doctors with three German veterinary officials in charge, mainly employed on supervision and control. Countermeasures against rabies and foot and mouth disease were introduced. The slaughter-houses were found to be in a neglected state. In the year 1942, 134,743 animals were slaughtered in 93 places. Inspection of meat was enforced in 1941–42 because of an epidemic of trichinosis. The report refers to the state of the milk industry, medical supplies and post-graduate education of veterinary surgeons. A large number of animals were slaughtered or castrated and stock of better quality imported.

—E. KODICEK.

HOFSTRA, S. T. (1946.) Een beschouwing over het inschakelen van hulpkrachten in de diergeneeskunde. [An observation on the employment of lay assistants in veterinary practice.]—*Tijdschr. Diergeneesk.* 71. 523–529. 2651

The communication is a reply by a veterinary practitioner to a contribution by DR. TENHAEFF, an inspector in the state veterinary service. Although the latter had rendered veterinary science and the practitioner a great service by controlling and curtailing the activities of the “quack”, H. disagrees with him about the eventual use of lay assistants in veterinary practice. He refers *inter alia*, to meat inspection, artificial insemination, veterinary supervision at stock sales and the mass treatment and diagnosis of certain stock diseases.

He notes that there is no legislation prohibiting the carrying out of artificial inseminations by lay inseminators and observes that practitioners are expected to attend sales for a fee of 4½ gulden [about 9s.] a day. In the newly introduced mass treatment of stock under the Health Service some of the work has been allocated to practising veterinarians. In some instances, *e.g.*, TB, control in Friesland, the veterinarian is assisted by lay assistants who are employed by the co-operative creameries. H. prefers to employ the assistant himself. Although TB. and pullorum control work does not interfere much with general practice, H. finds that artificial insemination has to be carried out at a time when there are also many calving cases.

H. suggests that every practitioner should be allocated a fixed number of patients, as in the case of medical practitioners and panel patients. This would increase the demand for practitioners, but would curtail the freedom of the profession. The present economic state of agriculture and the nature and the amount of work to be done necessitates the use of lay assistants. H. considers that lay assistants should be trained to perform certain types of work, either in the absence or under the

direct supervision of a veterinary surgeon. He suggests that a commission should be appointed

to investigate this problem and that the laws relating to veterinary practice be amended.

—P. L. LE ROUX.

See also absts. 2450 (bovine TB. in man).

LIVESTOCK HYGIENE

See also absts. 2455 (air-borne infection); 2477 (mouldy fodder).

ZOOTECHNY

PHILLIPS, R. W., & STOEHR, J. A. (1945.) **The accuracy of measurements and weights of sheep.** —*J. Anim. Sci.* 4. 311-316. 2652

Detailed results of a series of measurements on sheep are presented, the authors concluding that measurements which may be made with reasonable accuracy and may be of importance in experimental work include: weight, height at withers, length from mid-front of scapular to pin bones, width at shoulders, depths of chest and "middle", circumferences of chest and "middle", and circumference of foreshank. Measurements should be made on freshly sheared sheep and not from photographs.—G. B. S. HEATH.

HOFE, F. W. (1943-44.) Einführung in die neue Gebirgsremontierung: Die in Deutschland erstandene Zucht von Maultieren und Haflingern sowie deren heereigene Aufzucht als Tragtierersatz für unsere Gebirgstruppen. [The new Mountain Remount Service: breeding of mules and Haflinger ponies in Germany and their breeding by the Army as draught animals for mountain troops.]—*Z. Veterinärk.* 55. 333-362 & 56. 1-16. 2653

The first part of this paper describes the steps taken to provide the German army with mules and ponies suitable for transport in hilly and mountainous country. In 1935 there was no substantial mule breeding in Germany and donkey stallions which could beget suitable mules from German draught mares had to be imported. Suitable species were obtained from Italy and America and held at a number of mule breeding centres.

See also absts. 2566, 2658 (artificial insemination).

The ideal bodily conformation of mules and their temperament and hardihood are discussed. With right and sympathetic management, mules are excellent beasts of burden.

Attention is also directed to the Haflinger pony, an old breed native to Austria, but no breed of which previously existed in Germany, which was selected for breeding studs in Germany. This is a 140-155 cm. [approximately 15 hands] high, thickset but active pony which excels in hilly terrain, although apt to be excessively round barrelled, so that the securing of packs is not always easy. The characteristics of the breed are discussed.

The progress made in securing mules and ponies of the above types for the German army between 1937 and 1942 is described. Some outbreaks of strangles and strongylosis were experienced and some losses were sustained; no success followed efforts of the German "highly developed pharmacy". Allegan (Bayer) was much used as an anthelmintic, but proved to be insufficiently potent. The Richters-Frishbier tartar emetic treatment was too weakening for the younger animals. Finally, "santostibin" (antimony oxy-naphthalene methyloxyphenolate) was used. It is described as combining the actions of antimony with those of Santonin, male fern and naphthalene. It is said to be effective against both ascarids and strongyles and was much used. Hygienic measures employed are also described in detail.

The article is concluded by a stud list of the progeny of the several donkey and pony stallions.

—J. E.

TECHNIQUE AND APPARATUS

ANDRESEN, P. H. (1946.) **Apparatus for anaerobic cultivation.** [Significance of redox potentials in bacteriology.]—*Acta path. microbiol. scand.* 23. 158-163. [In English.] 2654

A detailed description is given of an apparatus in which cultures can be grown under conditions free of or with defined tensions of oxygen. Illustrations show the several components which

provide and maintain an atmosphere of nitrogen around the cultures in a bell jar. Numerous experiments dealing with redox potentials have been successfully carried out. A sensitive indicator for detecting traces of oxygen consists of 5 ml. of 2% fructose in Sørensen's phosphate buffer (pH 7.8) with the addition of 0.1% indigo-carmin.—J. KEPPIE.

MANWELL, R. D. (1945.) **The J.S.B. stain for blood parasites.**—*J. Lab. clin. Med.* 30. 1078–1082. [Author's conclusions copied *verbatim*.] 2655

The J.S.B. stain, recently introduced by Singh and Bhattacharji [see *V. B.* 16. 209], has been tested and been found superior in most respects to any of the other commonly used processes for the staining of blood and blood protozoa. The technique is simple and the staining process can be completed in less than two minutes for thin smears and in less than one minute for thick films. The staining solutions are not difficult to make up, are relatively inexpensive, and keep well for weeks or months, even in hot weather. Preparations stained by this process appear very much like those made by Giemsa's method, cytoplasm and chromatin of blood cells and parasites being differentiated with equal clearness and having similar color values. J.S.B. preparations are somewhat less resistant to fading but will stand much more exposure to light than they would ordinarily receive.

NAITO, T., & CHIN, R. (1941.) Beiträge zur Kenntnis über die Agglutination von *Sp. icterohaemorrhagiae*. Vorschlag einer Methode zur Abschätzung der Agglutination mit blossen Auge. [Agglutination of *Leptospira ictero-*

haemorrhagiae. A macroscopic agglutination test.]—*Jap. J. med. Sci.* 2. Pt. VI. 59–66. [In German.] 2656

The macroscopic agglutination test described depends on obtaining a luxuriant growth of leptospirae in culture for use as antigen. For this the simple rabbit serum of Korthof's medium is replaced by a serum containing traces of haemoglobin, prepared by defibrinating rabbit's blood, centrifuging and pipetting off the upper fluid. For newly isolated strains, vitamin B is also added.

0.1, 0.2 and 0.4 ml. of the antigen were added to 0.2 ml. of the serum under test in serial dilution and allowed to react for 1–3 hours in the thermostat, positive tests being indicated by a clearing of the upper fluid and the formation of a granular deposit. The serum under investigation had to be inactivated. The antigen was found to be reliable after 40 days when kept at 28°C., but was unreliable after 15 days when kept in the ice chest. The antigen could be preserved for a relatively long time by the addition of 1 % formalin. Heavier deposits were given in the serum when 1–2 % gelatin or 10–20 % of bouillon were added to the salt solution for the serum dilution.

The macroscopic method tested against the microscopic method gave similar results, and also gave specific reactions for various leptospiral strains.—U. F. RICHARDSON.

MISCELLANEOUS

PARNAS, J. (1946.) K zřízení Všešlovanské organizace veterinářů. [Foundation of the Slav Veterinary Union.]—*Čas. československ. Vet.* 1. 211–212. [In Russian and Czech.] 2657

P., who is the first Dean of the Veterinary Faculty of the Marie Curie-Sklodowska University in Lublin, Poland, lays emphasis on the need for close collaboration between Slav veterinarians and makes the following proposals:—

National veterinary committees should be elected for the U.S.S.R., Poland, Czechoslovakia,

Yugoslavia and Bulgaria, together with a central Slav veterinary committee; a congress of Slav veterinarians should be arranged and the *Revue vétérinaire slave* should be resuscitated. Committees should be elected to assist the most damaged Slav areas. The exchange of professors, assistants and students should be made possible and Slav veterinarians should be assisted in studies abroad. Research workers should be helped financially, as should the publication of veterinary literature.—E. PŘIBYL.

REPORTS

CANADA. (1946.) **Report of the Veterinary Director General for the year ended March 31, 1945.** [BARKER, M.] pp. 37. Ottawa: Printer to the King's Most Excellent Majesty. 8vo. 2658

No serious outbreak of contagious disease occurred in Canadian livestock during the year. Shortage of staff hampered work on eradication of BOVINE TUBERCULOSIS.—G. B. S. HEATH.

GREAT BRITAIN. (1946.) **Annual report of the Curator of the Laboratory, Royal College of Physicians of Edinburgh for the year 1945.** [LOW, R. C.] pp. 9. Edinburgh: Royal

College of Physicians. 2659

The only item of comparative interest in this report is reference to a second case of SARCOIDOSIS in the human subject. The importance of this disease lies in the characteristic histological appearance in the skin and lymph nodes and its association in the case cited with PULMONARY TUBERCULOSIS. This association raises a number of questions regarding doubtful and atypical tuberculous lesions.—D. D. OGILVIE.

GREAT BRITAIN. (1946.) **Royal Veterinary College and Hospital, Annual report for the**

academic year ended the 30th September, 1945.

pp. 4. 4to. Typescript. 2660

In the session 1944-45, 83 new students were admitted to the Royal Veterinary College, as against 71 the previous year. This brought the total number of students in the College at the beginning of the session to 317, compared with 296 in 1943-44. The percentage of passes for all students for the December, 1944, examinations was 68 and at the July examinations, 1945, 79% passed.

Subjects for research carried out by the different departments and the Research Institute of Animal Pathology are given. At this Institute, amongst the questions for research was that of JOHNE'S DISEASE experimentally induced in goats and the diagnosis of the condition in cattle; field trials for the prevention of *Corynebact. pyogenes* infection in cattle with alum-precipitated toxoid and methods to improve the potency of the immunizing agent were also undertaken.

At the Beaumont Animals' Hospital attendances at the clinic numbered 14,137, compared with 12,458 during the preceding year.

The Camden Town premises were taken over on being de-requisitioned and were to be used again in the forthcoming session. The West Grinstead Park Estate had been leased from September 29th, 1945.—D. S. RABAGLIATI.

GREAT BRITAIN. (1945.) **Annual report upon the health of Blackburn for the year 1945.** pp. 27. fcp. Typescript. Items of veterinary interest pp. 10-11. 2661

Of 191 milk samples examined at the County Laboratory only eight were found adulterated. The average composition of all samples was 3.53% fats and 8.87% solids not fats.

At the public abattoir 36,061 animals were slaughtered, of which 8,357 were cattle, 5,301 calves, 21,501 sheep and 902 pigs. In 2,152, there were signs of TUBERCULOSIS and of these, 267 carcasses were totally rejected.

4,568 visits were paid to butchers' shops during the year.—D. S. RABAGLIATI.

GREAT BRITAIN. (1945.) **Staffordshire County Council. Annual report of the Medical Officer of Health for the year 1944.** pp. 94. Items of veterinary interest pp. 56-60 & 62-70. 2662

Matters of veterinary interest are found in the reports of the routine work of the County Bacteriological Laboratory and that in accordance with the Food and Drugs Act, 1938. At the laboratory 16,358 milk samples were examined and investigations were carried out on 2,968 other materials, under the heading of "veterinary work, (other than milk, including research)", but it is not stated what these samples comprised. Of the

routine milk samples submitted to the biological test, six out of 174 from accredited herds, or 3.4%, contained tubercle bacilli; two out of 228 from T.-T. herds, or 0.08%, were positive; all of the 143 pasteurized milks were negative and 94 out of 1,786, or 5.2%, ordinary samples were likewise positive. Out of 89 samples of school milk, five, or 5.6% were tuberculous, making a grand total of all milks of 4.4% positive to the biological test.

It seems unfortunate that out of 106 suppliers of milk to schools only one, supplying 58 of the 51,978 children, has a T.-T. licence; the great majority of children receive pasteurized milk. A table is included showing the milks examined from the various sanitary districts of the county, 22 urban and ten rural. 1,493 samples were examined for cleanliness and 1,162 proved to be satisfactory, but it is not stated what standard was expected. Of this group of milk samples 1,446 were submitted to a biological test and 61, or 4.2%, were found to be tuberculous, a number lower than is frequently found. All cases of positive tuberculous milk were notified to the veterinary staff of the Ministry of Agriculture, who took the necessary measures.—D. S. R.

GREAT BRITAIN. (1946.) **Animal Diseases Research Association, Moredun Institute, Gilmerston, Midlothian. Annual report and accounts for 1945-1946. Report of the Director of the Institute for 1945-46.** [GREIG, J. R.] pp. 16. Gilmerston, Midlothian: Moredun Institute. 8vo. 2663

This short report is largely financial and statistical. The Association received a maintenance grant from the Development Commissioner of £12,372. Buildings for a byre and dairy for 12 cows to be used for MASTITIS research were completed early in 1945.

A table is given of the quantities of products issued in recent years: 185,150 doses of BRAXY vaccine were issued in 1945, as against 63,550 doses in 1935; 94,580 doses of LAMB DYSENTERY serum, as against 67,660 in 1935 and 221,810 doses of LOUPING ILL vaccine, as against 41,700 in 1935.

The following is a summary of the research work carried out during the year:—There is now reasonable belief that the vaccination of young lambs against LOUPING ILL is unnecessary if a high degree of immunity can be developed in the suckling ewe. This is true for most farms, unless the disease is particularly virulent. A single dose of BRAXY vaccine seems to be effective. There is reason to believe that SCRAPIE is due to a filtrable virus. Other diseases investigated were MASTITIS, PYAEMIA from tick bite in lambs, LACTATION TETANY, COBALT DEFICIENCY, MILK

FEVER, PARTURIENT REDWATER, YELLOWSES, and GRASS SICKNESS in horses, the last without any tangible result. The report ends with a list of publications by members of the staff.—D. S. R.

COLONY OF MAURITIUS. (1946.) [Report of] Veterinary Division [1945.] [LIONNET, F. E.] —*Rép. Dep. Agric., Mauritius*, 1945. pp. 28–30. 2664

Under the disease control measures, 192 bovines were tested with tuberculin (Weybridge P.P.D.), 37 giving positive reactions; most of these were sent to abattoirs. 5,735 animals were examined for TRYPANOSOMIASIS, blood smears being taken in each case. Only one was found to be positive, with infection due to *T. evansi*. The animal recovered after treatment with naganol.

In the animal husbandry section, experiments were carried out on artificial insemination: these proved successful, 80% of the cows inseminated becoming pregnant. 6,442 bullocks were imported for slaughter from Madagascar and Rodrigues and 2,322 sheep and goats and 905 pigs from the latter country.—D. S. RABAGLIATI.

ST. VINCENT. (1944.) Annual report on the Agricultural Department, 1943. pp. 12. Items of veterinary interest pp. 6, 9, 10–11. Kingstown: Govt. Printing Office. 4to. 2665

In 1943, 807 poultry, 614 goats, 48 pigs and 242 sheep were exported. No details of the incidence of disease are given.—M. C.

I. SWEDEN. (1942.) Sveriges officiella statistik. Hälso- och sjukvård. Det civila veterinärväsendet år 1940 av kungl. medicinalstyrelsen. [Report of the civil veterinary service for 1940.] [HOÖJER, J. A.] pp. 40. Stockholm: Kungl. Boktryckeriet. P.A. Norstedt & Söner. 2666

II. SWEDEN. (1942.) Sveriges officiella statistik. Hälso- och sjukvård. Det civila veterinärväsendet år 1941 av kungl. medicinalstyrelsen. [Sweden: Report of the civil veterinary service for 1941.] [HOÖJER, J. A.] pp. 42. Stockholm: Kungl. Boktryckeriet. P.A. Norstedt & Söner. 2667

III. SWEDEN. (1943.) Sveriges officiella statistik. Hälso- och sjukvård. Det civila veterinärväsendet år 1942 av kungl. medicinalstyrelsen. [Sweden: Report of the civil veterinary service for 1942.] [HOÖJER, J. A.] pp. 55. Stockholm: Kungl. Boktryckeriet. P.A. Norstedt & Söner. 2668

IV. SWEDEN. (1945.) Sveriges officiella statistik. Hälso- och sjukvård. Det civila veterinärväsendet år 1943 av kungl. medicinalstyrelsen. [Sweden: Report of the civil veterinary service for 1943.] [HOÖJER, J. A.] pp. 105. Stockholm: Kungl. Boktryckeriet. P.A. Norstedt &

Söner.

2669

I. Detailed statistical information is given in tabular form on the number and provincial distribution of veterinary surgeons, the numbers of animals examined and treated, the diseases encountered in each species, the numbers of animals killed for food, the diseases found at meat inspection and milk control data.

There were 601 veterinarians on the rolls, of whom the majority (254) were district veterinarians and 134 occupied with meat inspection.

During the year there were 82 cases of ANTHRAX. The year's work on BOVINE TUBERCULOSIS control is described in detail and tabularly. 174,000 cattle in 20,523 herds were tuberculin-tested for the first time and 15.8% reacted, whilst only 1.7% of 543,800 cattle in 39,148 herds previously examined and put under control reacted in 1940. Apart from these, 237,480 cattle in 15,941 herds were under control according to Ostertag's principles and were subjected to the bacteriological examinations of sputum, milk or genital tract excretion, a total of 3.8% being found infected. As a result, 816 cows were slaughtered. 5,807 cases of BOVINE BRUCELLOSIS were detected by district veterinarians and 6,351 of 65,857 blood samples gave a positive agglutination reaction. There were 14 cases of BLACKLEG. The outbreak of FOOT AND MOUTH DISEASE, which started in 1938, had not been suppressed before the beginning of 1940 and a few cases occurred in each of four southern provinces.

There were 127 cases of EQUINE INFECTIOUS ANAEMIA. In 1940 occurred the first outbreak of swine fever in Sweden since 1929; a few centres of infection being detected in 16 provinces before the close of the year. Kalmar was the most severely affected province with 151 infected premises. In May rigorous control regulations were prescribed and by July the epizootic had been checked and no new cases were observed anywhere again during the year except three in Uppsala province and one in Stockholm province, both in November. The origin of the outbreak outside Sweden could not be determined.

The meat and milk inspection work is reported mainly in tables. There were eight public abattoirs in operation and in addition 169 communal meat inspection bureaux were in operation during 1940. Sixty-four abattoirs under public control are also referred to.

The State Veterinary Bacteriological Institute with Prof. Hjærre and about 20 technical assistants dealt with over 10,000 examinations, apart from many thousands of blood samples for serological testing. Vaccines and special sera were produced in great quantity.

II. The number of veterinarians increased

slightly to 616 and close on 2,100,000 animals were examined or treated during the year.

In the campaign against BOVINE TUBERCULOSIS 18% of 307,000 cattle in 42,600 herds reacted to an initial tuberculin test, and in already-controlled herds 1.9% of 688,300 cattle in 58,540 herds reacted. In those herds controlled by the Ostertag method 240,400 cattle in 13,500 herds were examined and 6% were found to be infected. 600 cows were slaughtered. 6,667 cases of bovine brucellosis were diagnosed by district veterinarians and 8,900 of 133,700 blood samples reacted positively.

There were 66 cases of ANTHRAX and ten of BLACKLEG. FOOT AND MOUTH DISEASE was only observed in ten places, in six between January and April and in the remainder, after a pause of seven months, in December. Except in one instance, when segregation was enforced, all in-contact cattle, sheep and swine were slaughtered. There were 139 cases of EQUINE INFECTIOUS ANAEMIA during the year. Swine fever which had caused an extensive epizootic in 1940 did not appear in 1941.

Meat and milk inspection data are given in tables. The activities of the State Veterinary Bacteriological Institute resembled in kind and volume those of 1940.

III. The number of veterinarians rose to 625. Extracts from the reports of the provincial veterinary officials on the general state of animal health are quoted.

There were 24 cases of ANTHRAX in cattle and 14 in mink.

In the control of BOVINE TUBERCULOSIS by Bang's method 122,382 cattle were tuberculin-tested for the first time and 9.7% reacted. Of 689,747 cattle retested only 1.1% reacted. A table gives the results for each year from 1932: this shows a progressive decrease in infections in controlled herds. Under the Ostertag control scheme, 177,405 cattle were examined. The number of sputum, milk and vaginal excretion samples found to be infected is tabulated. 133 and 306 animals with TB. of the udder and uterus respectively were slaughtered. 65,000 cattle were examined for BOVINE BRUCELLOSIS and 2,851 were found to be infected. There were six cases of BLACKLEG in cattle. At the beginning of the year there were seven known cases of FOOT AND MOUTH DISEASE in Malmöhus province, but by April eradication of the disease had been effected. In December, however, it reappeared in a single large herd and its spread was prevented by slaughter. 124 cases of EQUINE INFECTIOUS ANAEMIA were diagnosed with laboratory aid, 63 occurring in the extreme northern province (Norrbotten). This represents a notable increase.

Statistics concerning meat and milk inspections are given.

IV. In 1943 there were 635 veterinarians. Figures for the years 1885-1943 show the steady increase to this maximum. Only 64 veterinarians were privately occupied, the others being state-appointed as provincial veterinarians, district veterinarians, municipal veterinarians, meat inspectors, quarantine and export veterinary inspectors, veterinarians attached to provincial agricultural society services and in a few additional categories of small numerical strength. The animal health situation in each province is described in general terms.

Twenty-one cattle and one horse had ANTHRAX.

In the control of BOVINE TUBERCULOSIS by Bang's method, 9.8% of 138,573 cattle tuberculin tested for the first time reacted and 0.8% of 726,462 cattle which had been tested before. Under the Ostertag method, 171,209 cattle were examined. Six cases of BLACKLEG occurred. Statistical figures for bacteriological examinations are given. 5,046 cattle out of 70,000 tested reacted serologically to BRUCELLOSIS. The country was free from FOOT AND MOUTH DISEASE from February onwards.

The history of EQUINE INFECTIOUS ANAEMIA in Sweden is traced since 1920. It has always been localized to the northern province of Norrbotten and in 1934 it was intensively studied by veterinary and agricultural experts, and differentiated from nutritional anaemia, which also was not uncommon. The role of any of blood-sucking flies was also considered, with the tentative conclusion that such flies [no name given] can spread the virus infection among horses on common pasture. The best control method is a combination of slaughter of diagnosed cases and avoidance of common pastures. Since this was begun in 1936, far fewer cases have been notified (31 in 1943). STERILITY in cattle is especially referred to and it is contended that the chief cause is nutritional. RICKETS and OSTEOMALACIA have been very prevalent during the last 25 years, with an average of 22,500 cases annually and other deficiency diseases have been widespread over the whole country, including ACETONAEMIA, PUERPERAL HAEMOGLOBINURIA, ANAEMIA and bone and muscle dystrophies. Some progress has been made in the provision of a research institution into sterility and deficiency diseases. In 1942 in a total cow population of 1,750,000, veterinary treatment for sterility was called for in over 80,000 and treatment for skeletal disease in 40,000. In this report is a special review on the hygiene of farm buildings in the several provinces and of the inspections carried out.

The usual meat and milk inspection statistics are given.—J. E.

TRINIDAD AND TOBAGO. (1945.) [Report of Senior] Veterinary [Officer, 1944]. [METIVIER, H. V. M.]—*Adm. Rep. Dir. Agric., Trin.* 1944. pp. 14-15. 2870

1,500 head of cattle were tested for TUBERCULOSIS and only three reactors were found, but two cases were notified from abattoirs. SWINE FEVER increased during the year, infection being spread by vultures. PARALYTIC (BAT - TRANSMITTED) RABIES increased and wholesale vaccination was performed. EQUINE ENCEPHALOMYELITIS also increased, there being 314 cases, of which 36 recovered. It was proved that the common vector was the mosquito *Mansonia titillans complex*. Wholesale vaccination of equines was enforced.

—R. MACGREGOR.

U.S.A. (Undated.) Los Angeles County Live Stock Department, California. Annual report for the fiscal year ending June 30, 1945. [HURT, L. M.] pp. 40. 4to. Mimeographed. 2871

The work of the Department was made difficult as a result of the war, so that projects of research work were largely abridged or discontinued. The livestock industry succeeded to a remarkable degree in meeting the food requirements of the consuming public.

To meet the increasing demand for fluid milk, dairy cattle importations were "stepped up" to 59,414 head, an increase of over 24% over the preceding year. The percentage of reactors in imported cattle was 0.389, as against 0.642 in the previous year; this was the first year in which the reactor percentage fell below the maximum tolerance of 0.5%, allowed under the Federal State Modified Accreditation requirements. There are 112,970 dairy cattle in the area tuberculin-testing scheme and 88,772 of these were tested, with a percentage of 0.095 reactors.

The report describes the common diseases encountered, but none of these caused any serious outbreak. MASTITIS was very common and TRAUMATIC PERICARDITIS and puncture of the liver or lungs with foreign bodies were sufficiently serious for the report to state that "the loss of cattle from this cause continues to lead all other single diseases in dairy herds".

Imports of horses reached 2,500 head per month, a large proportion of which were for slaughter.

A great deal of the report refers to poultry and their diseases, a large number of which are dealt with. Cannibalism was the source of a great loss in poultry housed intensively and this led to several experiments being carried out on the subject. "Debeaking" prevented losses from this cause, but presented problems in the feeding.

—D. S. RABAGLIATI.

BOOK REVIEWS

JORDAN, E. O. [Ph.D., Late Andrew McLeish Distinguished Service Professor of Bacteriology, University of Chicago], & BURROWS, W. [Ph.D., Associate Professor of Bacteriology, University of Chicago]. (1946.) *Textbook of bacteriology*. pp. xvii + 909. 242 figs. Philadelphia & London: W. B. Saunders Company. 8vo. 14th Edit. revised. 35s. 2872

This well known American textbook, first published in 1908, has now reached its 14th edition. This edition is a continuation of the rewriting started in the previous one. A new and long chapter on medical mycology replaces the chapters on the yeasts, the moulds and the actinomycetes. In a similar way, the chapter on parasitic protozoa has been expanded to include the flukes, tapeworms and roundworms. A considerable amount of new material has been incorporated in most chapters, with new sections on the respiratory enzymes and oxidation-reduction potential, the antibiotic substances, the mode of action of the sulphonamide drugs, iso-antigens and antibodies and on subjects of specifically medical interest.

The chapter on medical parasitology is written by R. J. PORTER, the chapter on viruses by F. B. GORDON.

The book is very well illustrated and the photomicrographs which are exceptionally clear are of definite value in aiding the text, a merit which is not common in text books of bacteriology.

The work covers the whole field of medical bacteriology in considerable detail, and as far as general principles are concerned will be of value to those engaged in veterinary bacteriology.

Organisms of veterinary importance are described in so far as they have a bearing on human disease.—D. L. HUGHES.

HEGH, E. [Ingénieur agronome, Lauréat de l'Institut de France, Sous-Directeur Honoraire au Ministère des Colonies]. (1946.) *Les tsé-tsés. Description-biologie-moyens de destruction*. [Tsetse flies.] pp. 115. 29 figs. 3 appendices. 7 refs. Bruxelles: Imprimerie industrielle et financière, Société anonyme. [Fr. 30.] 2873

This short book gives a concise account of

tsetse flies, their principal morphological characteristics, the classification and differentiation of species, the distribution of the various species, their habits and the methods of destruction and control. Particular attention is paid to those species occurring in the Belgian Congo.

The book is accurate and a feature is the quotation of the authority for statements, although actual references to the publications concerned are only given in the chapter devoted to destruction and control. This last chapter, although it gives the various principles which have been applied, is lacking in detail and gives no information as to what value the measures advocated have proved in practice.—U. F. RICHARDSON.

— (1946.) *Exposés annuels de biochimie médicale*. Sixième série. [Annual review of medical biochemistry. Sixth series.] [Edited by POLONOVSKI, M.] pp. 301. Paris: Masson et Cie. 8vo. Fr. 580. 2674

This review first appeared in 1938 and then irregularly throughout the war, reaching the present (sixth) volume in 1946. The lay-out is along conventional lines with well known authorities contributing reviews on specific topics. The present number contains contributions on eight subjects of medical biochemical interest. These are:—(I) Functional correlations between steroid substances, (II) Spectrography in biology, (III) Bleeding time: a statistical survey, (IV) Enzymes with dissociable metallic compounds, (V) Sodium and potassium in the animal organism, (VI) Biochemistry of the pterines, (VII) Fungal and bacterial pigments: antibiotics, and (VIII) Sulphur metabolism.

The occupation of France during the war and the severance of her contact with much of the world's literature has, of course, somewhat modified the value of these reviews for readers of the *Veterinary Bulletin*, although most contributors have made sterling efforts to catch up with the mass of outside literature to which they had not had access.

The article by the late Professor FLORENCE on spectrography has been included more as memorial than an up-to-date contribution to the subject; the author, after being interned in a concentration camp, was assassinated on the eve of the liberation of France.

The value of reviews on specific topics by authorities for the research worker cannot be overestimated, and the regular annual appearance of a volume dealing with subjects of medical biochemistry should certainly be noted and looked for by the specialist in this and in kindred fields.

—A. EDEN.

RHODES, H. T. F. [Dip. Inst. C. (Lyon); Correspondent of the International Academy of Criminology; Honorary Research Assistant in the "Conan Doyle" Laboratory of Chemical Research, Department of Technical Police, Prefecture of the Rhône, France]. (1946.) *Forensic chemistry*. pp. vii + 164. 4 tables. Numerous refs. London: Chapman & Hall. 2nd Edit. Revised. 15s. 2675

Forensic chemistry is fundamentally a specialist matter, and although it embraces an exceedingly wide field its direct application concerns a very small proportion of scientific workers. It is an education to read a work of this type, to learn that the working tools are essentially the same as those of any well equipped laboratory and to find that the methods employed involve familiar reactions.

Most readers will be aware of the tremendous advances in micro-chemical methods made in recent years and that with the development of more specialized physical equipment the chemist's ability to do more and more with less and less has increased to an extent undreamt of 50 years ago. The materials presented to the forensic chemist are such that micro-analytical methods offer the only possible approach to many of the problems he has to solve. His objective is usually well-defined, he knows what end is in view and his technique has to be adjusted and adapted accordingly. But the principles of that technique are fundamentally the same as those of other branches of chemistry, and that is precisely the impression one receives on reading through the present work.

The book is divided into two parts, the application of chemical methods to the direct and indirect identification of the person, and the application of chemical methods to the proof of *corpus delicti*. The first part covers subjects such as finger prints, dusts and blood groups. The second deals with such a miscellany as stains, firearms and explosives, inks, pigments, papers, banknotes and coins, and the examination of toxic agents. More attention is paid, perhaps, to the outlines of methods rather than minute practical details but this is only to be expected in a work of such modest dimensions. The principles of the techniques employed may contain the germs of ideas for readers who are not necessarily interested merely in forensic medicine.

Though the direct application of the subject matter is one which will concern a very few readers, there is a great deal in this book which will appeal to the general reader. The book is written in a very lucid and readable style, and it is very well produced.—A. EDEN.

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No. 2.—Issued June. Indexing period previous July—December.

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